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SOME TYPES OF IRRIGATION FARMING IN UTAH

A THESIS SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL OF THE UNIVERSITY OF MINNESOTA

By

EDGAR BERNARD BROSSARD, B. S., M. S.

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

June, 1920

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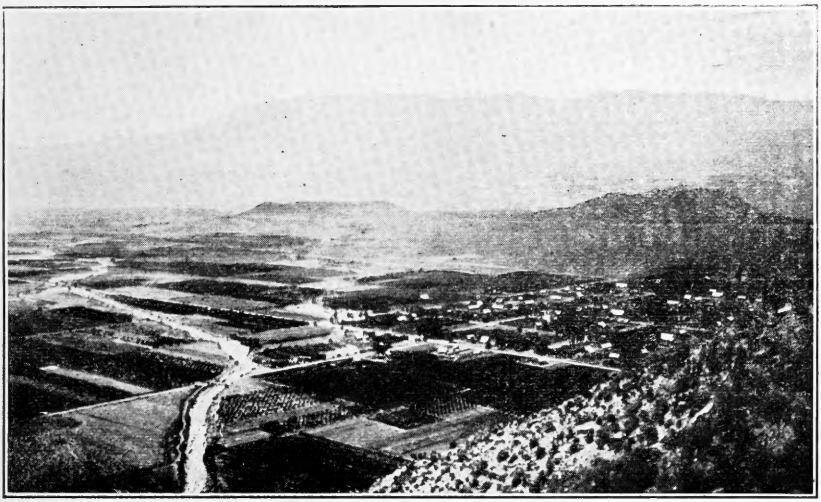

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ERRATA

Page 16, Table VII, "Receipts" from "Livestock" should be $782 instead of $798.

Page 55, Table XXXVI, "Expenses" should be $882 instead of $1,882.

Page 57, Table XXXVIII, under "Farm Capital", "Machinery" value should be $531 instead of $542.

Page 58, Table XXXIX, Miscellaneous receipts on the 10 better-paying farms should be $314 instead of $413.

Page 59, Table XL, under "Farm Capital", value of buildings on 10 better-paying farms should be $1,448 instead of $1,148, the value of livestock on the average of all 32 farms should be $1,584 instead of $1,534 and the total farm capital on the average of all 32 farms should be $12,057 instead of $12,056. The farm income on the 10 better-paying farms should be $2,855 instead of $2,885 and Labor income should be $1,730 instead of $1,760.

Page 98, Table II, "Crop Acres per Man", on the 10 better-paying farms should be 42 instead of 14.

SOME TYPES OF IRRIGATION FARMING IN UTAH(1)

By
E. B. BROSSARD

Meaning of Type of Farming.—As ordinarily used "type of farming" suggests general contrasts in the nature of farm business. The bases used in making these contrasts are: (1) sources of farm income, (2) number of farm enterprises, (3) amount of labor, capital, and management applied to each acre of land, and (4) farm practice with reference to maintenance of soil fertility. When based on sources of farm income, farms are classified as grain farms, hay farms, fruit farms, dairy farms, etc., according to the proportionate magnitude of the income from the different sources. When the number of farm enterprises is used as the basis, farms are classified as specialized or diversified. When the amount of labor, capital, and management applied to the acre of land is used as the basis, farming is said to be either extensive or intensive. When the farm practice of fertility maintenance is used as the basis of comparison, farming is either exploitive or conservative. These contrasts, tho arbitrary and general, are valuable in suggesting the extremes of farming types. In this study, not only the extremes are noted, but some small differences and similarities in the combination and inter-relations of the farm enterprises are pointed out. Amounts and kinds of crops and livestock raised, purchased, and sold are important as are also the amounts and combinations of machinery, buildings, land, water, labor, and management. Therefore, "type of farming", as used here means kind of farming, and in order to describe the kinds of farming practised in these areas in Utah, more detail is given than is ordinarily suggested by the phrase "type of farming."

The Ideal Type of Farming.—The ideal type of farming for any community at any one time is that which combines crops, livestock, machinery, buildings, land, water, labor, and management of such kinds and grades, and in such amounts, numbers and proportions, and in such ways as to yield the highest longtime average net returns for each unit of management or for each manager.

It is perfectly obvious that the farmer is not an independent, isolated individual, but a cooperating member of society. The farmer's business is not an independent one, but in these days of commercial agriculture, is dependent to a great extent upon the nation and society. Each farmer is a member of the present system of "Individual Exchange-Cooperation" (2) and all of the cooperating parties are entitled to consideration as factors in determining the ideal type of farming. There are cases where the immediate interests of the farmer are not in harmony with the best interests of the nation and society generally.

The fact that the farmer is a member of our competitive society must not be overlooked. The farmer desires to obtain as much for his wages of labor, wages of management, and pay for risk or responsibility taken, as he can get legitimately. In other words the farmer wishes the largest profits possible. In so far as the acts of the individual farmer, in seeking the largest possible profits from his enterprises, are in harmony with the best interests of the nation and society generally, it is to the advantage of the nation and society to permit him to attain his ambition.

Competition of Types of Farming.—Since so many conflicting factors contribute to the establishment of farming practice that no one

(1) Presented as a thesis in partial fulfillment of the requirements for the doctors degree (Ph. D.) at the University of Minnesota.

(2) Taylor, F. M., and Adams, E. C., Prin. of Econ. (1918), p. 12, Fifth Ed., Ann Arbor, Mich.

can hope to give proper consideration to all of them, it is impossible to tell the best type of farming for a given region without its being tried. In this study only the most conspicuous factors are considered. The effects of individual factors and sets of factors are different in different districts. The effects of similar factors often vary even for two adjoining farms.

It is likely that the types of farming practised in the areas investigated are, in general, the best since they are the results of fifty or more years of experience of the farmers of these areas. A half century ago these farmers, or their predecessors, obtained certain definite lands with given natural and economic conditions. As a result of their combined experiences, with the various crop and livestock enterprises, they were, in 1914, 1915, and 1916, following the practices described in this thesis.

Perhaps the chief factors in determining the type of farming in any region are the natural factors such as (1) climate, (2) soil, and (3) topography; but the economic factors of (1) demand, (2) supply, and (3) transportation, often established a type of farming in a community in spite of natural advantages and disadvantages.

The usual condition is not a given farmer seeking a certain sort of farm, but a particular farmer on a given farm desiring to know the proper type of farming. The important thing, therefore, is to learn of as many factors as possible,—if not of all the factors,—that influence particular types in individual areas, and to analyze their effects.

The fact that the elements that determine type are subject to frequent change makes the proper balancing of them difficult. The successful farmer must be keen, alert, progressive and use good business judgment if he is to keep up-to-date in his type of farming. New things are constantly being tried by one or more farmers. They should be generally adopted only when it is reasonably sure that their adoption will make the farm enterprise as a unit pay better than it does with present practices. Nothing but experience can prove a type of farming best for a given farmer and a given farm, and even after a successful year with a given type, a farmer is rarely sure that his type is the best. He frequently wonders if he would not have done better had he followed another type, and no individual will be able to give him a positive answer either in the negative or affirmative, because of the innumerable variables that affect the solution of the problem. But a study of the apparent factors may be suggestive. Because of these frequent changes in the economic conditions of a community, the type of farming must change and accommodate itself to the new conditions. Present practices have evolved slowly. Often ten, twenty, or thirty years go by before the best type is generally adopted by the farmers of a community. Some of the reasons why this is so are as follows: (1) the farm buildings are adjusted to the present type and changes are costly, (2) the machinery may require replacement by that more suitable to the new type, (3) city warehouses may be made useless, (4) credit may be hard to get, (5) markets for the products to be abandoned may be well established causing difficulty in changing to the new type, (6) the farmers and the public may lack knowledge concerning the new type, (7) the difficulty of distinguishing a temporary overproduction from conditions that call for the abandonment of a crop or stock enterprise operates against rapid changes, and (8) the natural conservatism of farmers keeps them from making the changes hurriedly. Types of farmers are often more persistent than types of farming.

It is evident that the best type of farming for a community this year may not be the best a few years from now. It is likely that before the majority of farmers have adopted the first readjustments they find it necessary to begin a second series. Sometimes a type pays so well or so poorly in a community that it is readily adopted or rejected by a major-

ity of farmers. More often, however, there are several or many competing types in each community and slight variations in the conditions cause gradual changes in type. It is in the interrelations of all the factors both natural and economic that the type of farming is determined, and as a rule the type practised is not far from what it should be.

Purpose of this Investigation.—Technically trained agriculturists have studied carefully many of the natural or physical factors of agricultural production. Some of the economic factors have also been analyzed and correlated. But not all of the interrelations of these factors and their effects on type of farming are generally understood. It is for the purpose of showing some of these interrelations and their effects on type of farming that this investigation is undertaken.

Collection and Preparation of Data.—Liberal use has been made of published and otherwise available material compiled by others, as is shown thruout the thesis by the numerous references. The data for the original investigation were collected by the writer and assistants. during the years 1914, 1915, and 1916, while he was in the employ of the United States Department of Agriculture and the Utah Agricultural College. The work was done in cooperation with the County Agricultural Agents and the Farm Bureaus of the respective counties in which the areas are located.

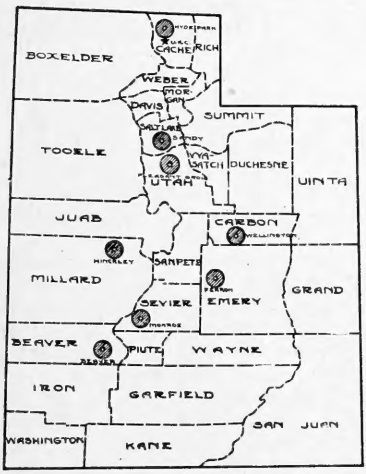

Fig. 1.—Location of the 8 areas investigated, Utah.

The areas investigated were chosen because they are representative of various types of irrigation-farming and of varied natural and economic conditions in irrigated areas in the Rocky Mountain States. Each area is discussed separately. Averages are usually used as the basis of analysis.

Some farms were dropped from the investigation after 1914 and 1915 respectively and other farms were added to the groups after 1914 and 1915 respectively. Only part of the farms have been cooperating the three years. This does not, however, impair the accuracy of the data for this investigation, since it is not its purpose to show the evolution of agriculture on the individual farms during this period, but rather the types of farming practised on these irrigated farms and the reasons for such types.

The data presented here have been calculated from records of farm business which were obtained by the Survey Method(1). The smallest number of records obtained at any one place was at Wellington, Carbon County, 1914, where only 26 were taken. The most taken was in the Sandy Area, Salt Lake County, 1914, where 72 were obtained. (See Table I.)

In the following areas, records were obtained for the three consecutive years, 1914, 1915, and 1916, for the farm business year beginning January 1: (1) Beaver, Beaver County; (2) Hyde Park, Cache County;

(1)Warren, G. F., Cornell University, Buls. No. 295, (March, 1911), No. 334, No. 344, (April, 1914); Spillman, W. J., U. S. D. A., Professional Paper, Bul. No. 529, (April, 1917); Thompson, E. H., U. S. D. A., Farmers' Bul. No. 661, (April, 1915).

Table I.—Number of Farm Records Studied Each Year by Counties, Utah

Year	Beaver	Cache	Carbon	Emery	Millard	Salt Lake	Sevier	Utah	Total
1914	50	52	26	39	59	72	63		361
1915	40	48		48	60	47	38		281
1916	44	32		34	39	45	57	57	308
Total	134	132	26	121	158	164	158	57	950

(3) Ferron, Emery County; (4) Hinckley, Millard County; (5) Sandy, Salt Lake County; and (6) Monroe, Sevier County. (See Table II).

Table II.—Number of Farm Records by Length of Record for each County, Utah

	Number of Farm Records for Each County							
Year	Beaver	Cache	Carbon	Emery	Millard	Salt Lake	Sevier	Total
1914	50	52	26	39	59	72	63	361
1914 & 1915	30	32		25	34	48	35	204
1914, 1915 and 1916	30	32		25	34	15	35	171

For the years 1914 and 1915, the center of the Sandy Area was Sandy, but in 1916 most of the records were taken at Draper, which is the township south of Sandy. The Wellington, Carbon County records were taken for 1914 only, and the Pleasant Grove, Utah County records were taken for 1916 only.

A study of the type of farming in any area has the five following phases: (1) enumeration and description of the individual crop and stock enterprises, (2) determination of the magnitude and importance of each separate enterprise, (3) determination of the combinations of the enterprises, (4) determination of the proportions in which the enterprises are combined, and (5) analysis of the factors affecting the choice of the enterprises and their combinations. As far as practicable, in this study, the descriptive part is given first and the analytical part subsequently. The Hyde Park area is treated in detail and the other seven areas only briefly.

HYDE PARK, CACHE COUNTY, UTAH

Location.—Hyde Park town is in Cache County, in the North Central part of the State of Utah. It is situated on the east side of Cache Valley at the western base of the Bear River Range of mountains. It is five miles north from the center of Logan, which had a population of 7,522 in 1910 (1), and is four miles south from Smithfield, which in 1910 had a population of 1,865. It is four and one-half miles north from the Utah Agricultural College. (See Figure 1).

Elevation.—The elevation is about 4,507 feet above mean sea level.

Crops.—Table XXX in the appendix shows the total area of the 32 Hyde Park farms and the use to which each acre was put in 1914, 1915, and 1916 respectively. It thus shows the kind and importance of the crops grown based on the acreage harvested. There has been a slight increase during the three year period in the acreage of winter wheat grown, for two reasons: first, the price of wheat has increased more than the price of the other crops; and, second, dry-farming has been extended to land that formerly has been used only as grazing land. Otherwise the changes in land ownership and operation and in the

(1)1910 U. S. Census.

Table III.—Tenure and Use of Farm Land, 32 Farms, Hyde Park, Cache County, Utah, 1914, 1915, and 1916

Items	Farms Reporting			Average Acres(1), 32 Farms				Average Acres(1), Farms Reporting			
	1914	1915	1916	1914	1915	1916	3-year Average	1914	1915	1916	3-year Average
Farm Area	32	32	32	115	119	119	118	115	119	119	118
Owned by Operator	32	32	32	92	96	93	94	92	96	93	94
Cash rented land	11	9	11	17	11	16	15	50	39	45	45
Share rented land	3	5	4	6	12	10	9	65	79	81	75
Crops	32	32	32	59	57	51	56	59	57	51	56
Pasture	28	30	....	41	39	....	40(2)	47	42	....	44(2)
Summer fallow	8	7	....	13	17	....	15(2)	52	78	....	65(2)
Farmstead and waste	32	32	....	3	6	....	4(2)	3	6	....	4(2)
Dry-farm land	10	10	12	34	37	....	36(2)	109	118	....	114(2)
Winter wheat	10	10	12	16	17	18	17	50	54	48	51
Barley	10	7	5	5	3	1	3	17	14	6	12
Summer fallow	8	7	....	13	17	....	15(2)	52	78	....	65(2)
Irrigated crop land	32	32	32	38	37	32	36	38	37	32	36
Alfalfa	30	27	30	13	12	14	13	14	15	15	15
Timothy and clover	10	13	6	2	4	2	3	8	10	8	9
Wild hay, etc	7	5	10	4	4	3	4	19	24	8	17
Sugar-beets	29	29	29	10	9	9	9	11	10	10	10
Oats	22	24	20	4	3	2	3	5	4	4	4
Spring wheat	14	17	14	3	3	2	3	6	5	5	5
Alfalfa seed	1	1	0	0	0	0	0	12	15	....	14(2)
Potatoes	27	19	13	1	1	0	1	2	1	1	1

(1) Areas are given to the nearest acre. No attempt was made to force the figures to check.

(2) Average for 1914 and 1915 only.

acreages of the various crops grown are not marked enough nor regular enough to illustrate anything but a satisfactory and stable condition. No radical changes have taken place in the three-year period of this investigation. It is true that the prices of farm products changed during the period, but the type of farming has not changed greatly. The prices of most of the farm products grown here have increased normally. The respective crop ratios have not changed much.

Table III shows the tenure and use of farm land. The 32 farms have an average area of 118 acres, 94 of which are owned by the operator, 15 cash rented, and 9 share rented. There were 56 acres of crops harvested on the average, 36 of which were irrigated crops and the remaining 20 acres of which were dry-farm crops. The remaining land was used about as follows: 40 acres for pasture, 15 acres for summer fallow, and 4 acres in farmstead, roads, and waste.

The recording of the pasture, summer fallow, and waste land in 1916 was not done satisfactorily and therefore is omitted. Because of this fact the three-year average area does not check, but it is nevertheless sufficiently accurate for the present purpose.

Of the dry-farm land, 17 acres were in winter wheat, 3 acres in barley, and 15 or 16 summer fallowed. The 36 crop acres of irrigated land were cropped as follows: (1) hay, 20 acres divided as follows: alfalfa, 13 acres, timothy and clover, 3 acres, and wild hay and oat hay, 4 acres; (2) sugar-geets, 9 acres; (3) oats, 3 acres; (4) spring wheat, 3 acres; and (5) potatoes, 1 acre.

That these crops are grown successfully is shown by the average yields as given in Table IV.

Table IV.—Crop Yields on Hyde Park Farms, 1914, 1915, and 1916

Crop	Average Acre-Yields							
	1914			1915			1916	
	All 52 farms	32 farms	10 better-paying farms	All 48 farms	32 farms	10 better-paying farms	All 32 farms	10 better-paying farms
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Alfalfa	4	3.8	3.6	3.4	3.5	3.4	2.7	2.9
Other Hay	2.6	2.4	2.4	2.2	2.2	2.8	2.0	1.8
Sugar-beets	18.6	18.6	18.6	16.5	16.6	18.0	15.2	15.6
	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.
Oats	70	69	71	68	64	63	58	83
Irrigated Wheat	31	32	24[1]	36	44	36	34	32
Dry-farm Wheat	27[1]	24	24[1]	21	21	19	18	20
Dry-farm Barley	28[1]	24[1]	23[1]	11	13[1]	8	25[1]	26[1]
Irrigated Barley	28[1]	24[1]	23[1]	41	13[1]	60	25[1]	26[1]
Potatoes	178	188	205	56	52	36	172	160

The low yield of potatoes in 1915 was due largely to the plant diseases, Fusarium Wilt and Rhizoctonia. All yields except that for spring wheat were lower in 1915 than in 1914. The yields for all crops except

(1) Includes that grown on both the dry-farm and irrigated land.

oats and barley were lower in 1916 than in either 1915 or 1914. This was due mainly to less favorable climatic conditions(1) and to plant diseases. However, the yields in 1916 are good compared with the average for the State and the country as a whole.

The average yield of hay, potatoes, corn, winter wheat, spring wheat, oats, and barley in Utah is 184 per cent of the average yield of the United States and is 174 per cent of the average yield of the State of Iowa. (See Tables XXXVIII, XXXIX and XL in Appendix.)

Pasture.—Table III shows that there are about 40 acres of pasture per farm. Almost all of this is permanent pasture. Most of it is on the wet clay-land west of the State road. The greater part of this land west of the State road is used for pasture or meadow. Whether it is pastured or cut for hay is largely a question of need of hay or pasture. Some of this land is cut for hay some years and pastured others. However, much of the land pastured cannot be cut for hay at all until it is drained. It would not pay to cut for hay some of the higher ground in the fields, unless they were leveled and irrigated, as the yield of hay would be too low. Usually, therefore, this land is either in permanent pasture or permanent meadow depending on the soil, topography, possibilities of irrigation, and need of either hay or pasture, on the particular farm. It would not pay to cultivate this land in its present condition.

Some of the permanent pasture land is on the foot-hills and mountains. This land has no other use to which it might be put. If it was not pastured or grazed it would have no agricultural value at all.

Some of the dry-stock of the dairy herds and most of the meat cattle are grazed on the Cache National Forest. This reduces the number of acres of farm pasture necessary to furnish summer feed for stock.

It is largely on account of these pasture conditions at Hyde Park that the dairy industry has developed to its present importance and that the sales of cattle amount to as much as they do.

Dry-farm Wheat vs. Barley.—Two important questions concerning dry-farm wheat and barley are: (1) Why are wheat and barley grown on the dry-farm lands? and, (2) Why does each have its present importance? The answers involve a number of factors, some of which are as follows: (1) wheat and barley are grown because they are the two most successful dry-farm crops(2), (2) wheat is grown as a cash crop, (3) the yields are usually slightly greater for wheat than for barley(3), (4) the price is generally considerably higher for wheat than for barley(4), (5) the cost of production is practically the same for wheat as for barley(5), and (6) barley is more difficult and disagreeable to handle.

The question then arises as to why any barley at all is grown. Why is not all the land planted to wheat? There are three good reasons for planting some barley. (1) Barley is used as feed. (2) A better distribution of labor is obtained by growing both barley and wheat than by growing only wheat. When the feed or labor situation dictates the planting of barley or some less profitable crop or no crop, barley is chosen. (3) Alternate cropping of wheat and barley may increase the yield, as barley is a more shallow rooted crop than wheat.

Hay.—Table III shows that on the 32 farms an average of about 20 acres of hay are grown, of which 13 acres are alfalfa, 3 acres are timothy

(1)U. S. D. A., Weather Bureau Reports.

(2)Widtsoe, J. A., Dry Farming—Text, (1911) pp. 234-243, McMillan Company.

(3)See Table IV. Crop Yields on Hyde Park Farms, 1914, 1915, and 1916.

(4)See Table XXIX. Farm Prices of some Utah Farm Products, Appendix.

(5)Peck, F. W., Minn. Agr. Exp. Sta. Bul. No. 179, (Nov. 1918), pp. 27-29.

and timothy and clover, and 4 acres are wild hay and oat hay. Oat hay is cut only in emergencies and the amount is negligible. Wild hay is grown on land that at present is too low and wet for cultivation. Some of it is wet naturally, but some is made too wet for cultivation by irrigation of the higher land nearer the mountains. The timothy and timothy and clover are grown largely for horse feed. As a rule it is grown on land that would grow alfalfa but occasionally timothy and clover seed are sown on land that is slightly too wet for alfalfa. Some timothy and clover is also raised in crop rotation instead of alfalfa because sugar-beets are more easily handled on this than on alfalfa sod.

Alfalfa is the main hay crop and constitutes about 65 per cent of the total hay acreage. On suitable land so situated as to be irrigable, alfalfa has no near rival when grown for feed for dairy cows or other cattle. Its feeding value and its high yields make it king of the irrigated feed crops.

But now the question arises as to why these farmers grow on the average 13-15 acres of alfalfa and 9 or 10 acres of sugar-beets when much of the land that grows alfalfa might be planted to sugar-beets or vice versa.

Alfalfa vs. Sugar-beets.—Sugar-beets are usually grown on the best piece of land on the farm. From 4 to 6 times as much labor is put on each acre of sugar-beets as on an acre of alfalfa. For this reason it would be unwise to plant beets on inferior land. The reasons why 10 acres of beets are grown are given later. But why grow 13 to 15 acres of alfalfa? The farm family wants to make as much as possible out of the farm. To grow alfalfa for livestock that may be pastured in summer, and fed in winter, with a fairly good market for dairy products existing, gives a better labor distribution, makes it possible to do some productive work in winter, and saves paying out an excessive amount for wages for hired help in summer, and therefore nets a greater income, than planting sugar-beets on all of the good arable irrigated land. The present acreage of alfalfa is sufficient, when the other hay is added to it, to feed the stock inventoried and in normal years a small surplus is sold. In abnormally poor hay years, or years when excessive amounts of feed are required, the hay is all fed in the district.

Oats vs. Spring Wheat.—Table III shows that on the average 3 to 4 acres of oats and 3 to 5 acres of spring wheat are grown on the farms at Hyde Park. These crops are non-competing. Growing both gives a better distribution of labor than growing either one to the exclusion of the other. Oats are grown mainly for horse feed. Four acres at 65 bushels to the acre gives a total yield of 260 bushels for an average of 4 work horses or 65 bushels of oats each year for each horse. Not all of these oats are fed to horses, however, as some are also fed to cows in the district, and a few are shipped out of the district.

The spring wheat is grown as a cash crop on irrigated land. It is sometimes alternated with oats and sometimes it is seeded on alfalfa sod the year before sugar-beets are planted. Alternating wheat and oats gives greater yields; and the planting of wheat on alfalfa sod allows the alfalfa roots and crowns to largely decompose, which facilitates beet culture the following year.

Sugar-beets vs. Potatoes.—Sugar-beets and potatoes are crops that compete for capital, labor, management, and irrigated land. The question arises as to why they are grown in the present proportions. Why is it, that on the farms reporting these two crops, 9 to 10 acres of sugar-beets and less than 1 acre of potatoes are grown? The answer divides naturally into several parts. The 10 to 11 acres of sugar-beets and potatoes are grown instead of more acres of these crops largely because the farm family is the basic unit, around which the farm business is organized, and 10 or 11 acres of these comparatively intensive crops are about all that the average farm family can handle without hiring excessive amounts of

labor during rush seasons. Some of the reasons why 9 or 10 acres are devoted to sugar-beets and only 1 or less to potatoes are brought out in the following pages.

Table V shows that the average acre-value of sugar-beets for the three years, 1914, 1915, and 1916, was $79, and for potatoes $77, or but $2 higher for sugar-beets than for potatoes, or 3 per cent of the average acre-value of potatoes grown.

Table V.—Yield, Price, and Acre-Value of Sugar-beets and Potatoes, 1914, 1915, and 1916, Hyde Park, Cache County, Utah

Year	No. Farms Reporting	Average Acre-Yield		Average Unit-Price		Average Acre-Value of Total Product	
		Sugar-beets	Potatoes	Sugar-beets	Potatoes	Sugar-beets	Potatoes
1914 ..	52	18.6 T.	178 Bu.	$4.50	$ .43	$84	$77
1915 ..	48	16.5 T.	56 Bu.	4.75	.50	78	28
1916 ..	32	15.2 T.	172 Bu.	5.50	.74	74	127
Average for the three years						$79	$77

Some of the potatoes were stored and sold in the spring while all of the sugar-beets were marketed directly from the fields in the fall.

In 1914 the average acre-yield of potatoes was 178 bushels. The average price of those sold was 43 cents a bushel. The total value of the product of an acre was, therefore, $77. The average acre-yield of sugar-beets was 18.6 tons. The average price received for a ton was $4.50. Thus the acre-value of the product was $84 or $7 more than for potatoes.

Seed potatoes cost about $5 to $8 an acre, or $3 to $5 more for each acre than sugar-beet seed, which cost $2.25 an acre in 1914. In areas somewhat similar to the Hyde Park district, the total cost of producing a ton of beets in 1914 and 1915, where the acre-yield was 16 tons or over, varied from $3.93 to $4.12(1). The net returns, including tops, varied from $6.85 to $9.23 an acre(1).

The total water requirements for the two crops are about the same, but the best times for applications differ. The irrigating of sugar-beets is not such a precise task as irrigating potatoes.

The labor requirements for potatoes are about 114 man hours and 115 horse hours an acre annually(2). The labor requirements for sugar-beets are about 143 man hours and 142 horse hours an acre annually(2)(3). Sugar-beets require about 26 per cent more man labor and 23 per cent more horse labor than potatoes. From 54.4 to 56.3 per cent of the total cost of producing sugar-beets is labor cost(3). The harvesting of beets requires about the same amount of labor as harvesting potatoes and both crops are harvested at about the same time of the year. The labor in the other periods is also competitive but more labor is required each period for sugar-beets than for potatoes.

(1)Moorhouse, L. A., and others, U. S. D. A. Bul. No. 693, (July, 1918), p. 41.

(2)Connor, L. G., Utah Agr. Exp. Sta. Bul. No. 165, (Oct., 1918), Tables 15 and 6, p. 20.

(3)Moorhouse, L. A., and others, U. S. D. A. Farm Mgt. Bul. No. 693, (July, 1918), p. 42, gives the annual labor requirements for an acre of sugar-beets as from 119.4 to 133.3 man hours and 79.3 to 117.14 horse hours.

The $2 excess in acre-value of product of sugar-beets over potatoes is only 6-2/3 cents an hour for the 30 additional man hours required to produce each acre of beets.

These facts seem to indicate that if all labor was hired the potato crop would be much more popular in comparison with sugar-beets. The great amount of unpaid family labor at Hyde Park makes it more profitable to raise sugar-beets than potatoes because in raising beets the annual net returns for this labor is slightly greater. This indicates that the farm family is the basic unit of production and not alone the farmer or head of the family.

The rather heavy compact soil at Hyde Park is generally better adapted to sugar-beet than potato culture.

Another reason why sugar-beets are grown instead of potatoes is that there is but a limited local market for potatoes. The products must compete in distant markets. Beets are manufactured into sugar. This final product is a much more concentrated (less bulky) product than potatoes and can thus compete more favorably in distant markets than can potatoes. This fact has made it possible for the sugar manufacturers to pay a price for beets sufficient to induce farmers to grow them instead of growing potatoes.

The factories do not necessarily have to pay sufficiently high prices for the beets to make growing them as profitable to the farmer as the potato crop, because by their method of contracting for the beets they relieve the farmers of the risk of loss from low prices. Before the farmer plants his sugar-beet seed he knows what price he will get for each ton of his product marketed in the fall. The farmers contract with the sugar companies to raise a certain acreage of beets, and for each ton marketed in the fall they receive a contract price. This almost assures the farmer a profit from raising beets unless the year is so abnormal as to cause a crop failure. In raising potatoes the farmer takes the risk of low prices as well as that of crop failure. The sugar manufacturing companies have had the advantage of all increase in the price of sugar and have borne the risk of a decreased price. These companies, however, are more able to take this risk in speculating than the farmers and the majority of farmers are glad to have them do it, as farming is thus made more stable. Consequently farmers are usually willing to allow the sugar companies a reasonable remuneration for this service.

The question that now naturally arises is: why are there any potatoes at all grown here. The main reason is that they are grown for home use and it is good business to grow them for this purpose even tho they are not as profitable a commercial crop as sugar-beets. When a very good crop of potatoes is raised there are more than enough for family use and some are sold, but usually this surplus is small. The growing of commercial potatoes in this district is sporadic. After a good potato year a few farmers are tempted to plant potatoes as a commercial crop. A few farmers plant them after alfalfa and before sugar-beets in the crop rotation because of the difficulty of growing sugar-beets following alfalfa on account of the undecayed alfalfa roots and crowns.

Livestock.—Table VI shows the average number of livestock units(1) on the Hyde Park farms cooperating in this investigation. The units for 1916 are not calculated as the two-year average is sufficient for the purposes of this paper.

There were 12 per cent more animal units on farms at Hyde Park

(1)An animal unit is 1 cow, 1 bull, 1 grown steer, 2 young stock, 1 horse, 2 colts, 7 sheep, 14 lambs, 5 hogs, 10 pigs, or 100 poultry. The basis for such classification is the amount of feed required and manure produced.

in 1915 than in 1914. There were fewer work horses and more productive animal units(1) on the farms. There was an increase on the average of 0.7 units of milk cows, 1.6 units of other cattle, and 0.2 units of other horses. There was 0.1 unit fewer hogs, but the same number of poultry in 1915 as in 1914.

Of the 52 farms investigated in 1914, 1 had no milk cows, 1 had 1 cow, 6 had 2 each, 14 had less than 5 each, 7 had 10 each, 8 had more than 10 each, 2 had 20 each, and 1 had 24 milk cows. The one farm that had a man hired by the year was one of the two farms that had 20 milk cows. All of the milking and other work on livestock on the other farm with 20 cows and also on the farm with 24 cows was done by the respective farmers and their families with extra help hired during rush crop-seasons. On the average there were 7.4 units of milk cows on the 32 farms which have cooperated for the three years. The most promising heifers are raised to replace the cows in the dairy herd and usually a few more are raised than are kept on the home farm as cows.

In 1914 the net livestock receipts(2) for each $100 worth of feed fed were $107 on the 52 farms and $120 on the 10 better-paying farms. The net livestock receipts for each productive animal unit were $60 on all 52 farms and $60 also on the 10 better-paying farms. The net cattle receipts for each head kept were $22 on the average of the 52 farms and $22 also on the average of the 10 better-paying farms. The milk receipts for each cow were $56 on the average of all farms and $62 on the average of the 10 better-paying farms.

In 1915 the net livestock receipts for each $100 worth of feed fed were on the average of all 48 farms, $97, of the 10 least-profitable farms, $52, and of the 10 better-paying farms, $133. The net livestock receipts for each productive animal unit were $25 on the average of all 48 farms, $24 on the 10 least-profitable farms, and $57 on the 10 better-paying farms. (See Tables I and II in Appendix).

Why do Hyde Park farmers on the average keep from 7 to 10 milk cows and why does the number of head vary from none to 24 on the individual farms? In general, the available pasture determines the

Table VI.—Average number of Units of Livestock on Farms, Hyde Park, Cache County, Utah, 1914 and 1915

Kind of Livestock	Average Number of Units of Livestock on Farms				
	32 Farms			52 Farms	10 Better-paying Farms
	1914 and 1915	1914	1915	1914	1914
Total animal units	19.5	18.4	20.6	18.8	29.3
Work horses	3.9	4.0	3.8	4.0	5.6
Productive an. units	15.6	14.4	16.9	14.8	23.7
Milk cows	7.4	7.1	7.8	7.5	10.1
Other cattle(3)	5.8	5.0	6.6	5.1	9.5
Other horses(4)	1.2	1.1	1.3	1.0	2.1
Sheep	.1	.1	.1	.0	.1
Hogs	.6	.6	.5	.6	1.1
Poultry	.5	.5	.5	.6	.8

(1) "Productive animal units" includes all livestock except work stock.

(2) The net livestock receipts are found by subtracting the sum of the purchases and what is on hand at the beginning of the year from the sum of the sales and that on hand at the close of the year.

(3) Includes dry dairy-stock and beef cattle.

(4) Includes colts, ponies, and stallions.

amount of livestock kept and there are at present about as many units kept on each farm as the pasture, in its present condition, will support. Counting 7.4 units of milk cows and 2.6 units of young dairy-stock as being pastured on the farms, there are 10 animal units to 40 acres of pasture, or 4 acres to each animal unit pastured. The 40 acres of pasture includes tillable pasture, low wet-land, unirrigated bottom-land, and mountain pasture. There are about 2.8 acres of pasture for each productive animal unit. However, some of the meat cattle and dry dairy-stock are grazed on the Cache National Forest. From 1 to 3 acres of irrigated pasture is sufficient for an animal unit, but from 10 to 30, or an average of about 17 acres(1) of mountain pasture is necessary for each animal unit for the grazing season of 5 to 8 months. That the Cache National Forest is grazed to about its full capacity is shown in the paragraph on the National Forests. From personal inquiries and observations extending over the period of this investigation, the writer is convinced that unless pastures are improved, but slight increases are possible in the number of cattle kept. The farmers know quite generally that it is to their advantage to keep as many as they have pasture for. The hope of the future is therefore in the improvement of the pastures and stock kept.

Another factor which sometimes limits the number of cows kept is the number that can be milked by the average farm family, without hindering too much the work on cash and feed crops. This does not seem to be effective here, as the average farm family at home in 1914 consisted of 6 persons. Without neglecting crop work, education, or social duties, undoubtedly more than 7.4 cows can be milked without the aid of the farm women in doing it.

The variation in the number of cows kept on the individual farms is also due to the available pasture. But it is also a result of the variations in capacity and efficiency of individual farmers and farm families. Personal factors affect individual cases and thus affect the average of the district. These points are further discussed in the paragraphs on Population, The Farm Family, and Farm Labor.

The question arises as to why there are any beef cattle kept at all. Why are not sufficient dairy cows kept to utilize all of the farm pasture and available grazing land? As a rule the beef cattle are range cattle. They do well on the range but milk cows give but little milk if turned out on the range each morning. They have to travel too far to get to the range and when they get there, feed is too scarce to produce much milk. Therefore to utilize the range to best advantage range stock are kept on it. The reason that milk cows are kept instead of all range stock is because the farm pastures and farm labor are more profitably utilized with milk cows than with range stock. It is true that the two farmers who have considerable numbers of range cattle have been making good labor incomes. In fact their farms have been classed among the 10 better-paying farms each of the three years. But they have permits to graze their cattle on the Cache National Forest and the other farmers cannot get such a permit readily and find it necessary therefore to keep dairy cows. This point is further discussed in a later paragraph.

Colts are raised both for work and for sale. Hyde Park has somewhat of a reputation among farmers of Cache County for the grade Percheron horses raised there. Horse buyers from Los Angeles and elsewhere recognize that at Hyde Park good, sound work horses can be bought. The farmers take pride in good colts. Purebred stallions are maintained in the district. They are usually owned cooperatively.

In 1914 on the average of all 52 farms there was 1 work horse to each 14 acres of crops. The same ratio existed in 1915. The ratios on the

(1) Barnes, W. C., and Jardine, J. T., U. S. D. A., Office of Sec., Rep. No. 110 (July, 1916), p. 87.

averages of the 10 better-paying farms in 1914 and 1915 respectively were 1 horse to 19 acres of crops and 1 horse to 15 acres of crops. (See Tables I and II in Appendix).

Farms that have milk cows that are driven down and up the "Cow Lane" to and from the pastures, usually have ponies for the children to ride in making this trip.

Only 5 farms have any sheep, 1 has but one sheep, 1 has 2, 1 has 10, 1 has 14, and 1 has 19 sheep, making in all a total of 46 sheep including lambs. These few sheep are kept as scavengers. They clean out the weeds along the irrigating ditches and fences and clean up around the farmstead.

Hogs are raised mainly for home use. Most of them are bought as pigs, raised, and then butchered. A few farmers keep 1 to 4 brood sows and sell the pigs as little pigs, except enough for their own table use. One reason why more hogs are not kept is because all the farm homes and buildings are in town on town lots. A herd of hogs would be very undesirable under these conditions.

Hens are kept mainly to supply the farm family with eggs and meat. The surplus eggs are sold at the town store. Unless poultry is fenced in, it may be a nuisance to neighbors where houses are close together, gardens not protected with chicken wire, and the garage door not always closed. Only 5 farms report having 100 hens or more, 2 of these have just 100 each, 1 has 130, and 2 have 200 each. All of these farm homes are out of the town proper, except 1 and that one is on the northeast corner of a block and no other house is within a block of it.

The hogs and hens are fed largely on table scraps, grain screenings, skim milk, and other waste-feeds. Bran and shorts are sometimes fed to hogs for a short period before killing. The bran is obtained from grists. The wheat is taken to the mill and flour and bran brought back.

Summary of Crops and Livestock.—The details of crop and livestock conditions at Hyde Park have been given in the previous paragraphs. There are three general outstanding features, however, of which special mention should be made. The first distinctive thing to note is that most of the farm land is irrigated and most of the farmers raise sugar-beets on a part of this irrigated land and milk a few cows. But the irrigable land and irrigation water are limited. Suitable pasture for milk cows is also limited. To extend the individual farm business by buying irrigated land means to leave some one else less irrigated land to operate. The same is true with pasture. Therefore to extend the individual farm business in either of these two directions means to eliminate to that extent the competition of one's neighbors. The second distinctive factor is the dry-farming practised by a few of the farmers. And one should note that there is only a limited amount of dry-farm land and this has already been utilized by farmers desiring to extend their farm business rather than by new men specializing in dry-farming. The third feature which deserves special mention in this summary is the range cattle business. There are only a few men who run range cattle on the Cache National Forest. This is because it is so difficult to obtain grazing permits, as the range is stocked to its present capacity. These three features are important. They are found in varying combinations in many districts of the intermountain region. But they are not found in any other section of the country combined in exactly these same proportions.

Diversity and Balance of Farm Business.—Why do farmers raise sugar-beets and wheat instead of raising more pasture, barley, oats, and alfalfa as feed for livestock? While sufficient data to prove the point is lacking the obvious answer to the question is that livestock enterprises are not sufficiently profitable to cause the farmers to give up growing these cash crops for the other practice. On the average the combination is more profitable than the specialization. Raising cash crops utilizes the

available summer labor to good advantage. The sugar-beet crop, especially, makes labor for school children. The combination of livestock and these cash crops makes a more diversified and better balanced farm business and therefore a safer and more desirable business for the average farmer than the specialized livestock farming.

In 1914 the average number of different crops grown on the 52 farms was 4.6. There were 3 sources of income the receipts from each of which amounted to at least 8 per cent of the gross farm receipts. These three were sugar-beets, $705; milk and its products, $400; and grain, $302. The average incomes from other sources were hay, $44; potatoes, $16; fruit and vegetables, $7; cattle, $227; horses, $87; other livestock, $68; miscellaneous receipts, $238; and increase in inventory, due largely to livestock and feed and supplies and improvements, $416. (See Tables VII in Text and I in Appendix).

Table VII.—Farm Receipts and Expenses, Average of 52 Farms, Hyde Park, Cache County, Utah, 1914

Receipts			$2,510
Crops		$1,074	
Sugar-beets	$705		
Small-grains	302		
Hay	44		
Potatoes	16		
Fruits and Vegetables	7		
Livestock		798	
Milk and milk products	400		
Cattle	227		
Horses	87		
Other Livestock	68		
Miscellaneous receipts		238	
Increase in inventory (largely livestock and feed)		416	
Expenses			882
Labor		387	
Hired labor and board	183		
Unpaid family labor	204		
Taxes (personal and property including water tax)		109	
Other farm expenses (1)		386	

Of the total receipts, $1,074 or 43 per cent were from crops, $798 or 32 per cent from livestock and livestock products, $400 or 16 per cent from increase in inventory, and $238 or 9 per cent were from miscellaneous sources, the main one of which is outside labor. Of the $882 of farm expense, $387 or 44 per cent was for labor. Excluding taxes the expense for labor including unpaid family labor amounted to 50 per cent of the total expenses.

In 1915 the average of 48 farms shows that 35 per cent of the total farm receipts were from stock and stock products. (See Table II in Appendix).

The 10 better-paying farms grew on the average 5.1 different crops and had 4 sources of income each of which was over 8 per cent of the gross farm receipts. The sources of income were sugar-beets $1,075, grain $891, milk and its products $597, and cattle $356. In 1915 on the average of the 10 better-paying farms the receipts from stock and stock products amounted to 38 per cent of the total farm receipts.

(1) Includes building, fence, and machinery purchases, repairs, and depreciation; roughage and concentrates bought for feed; horseshoeing; breeding fees; veterinary bill; medicine; twine; threshing; fees; etc.

The balance between livestock kept and pasture has been discussed in a former paragraph.

On the average one work horse is kept to each 14 acres of crops but on the 10 better-paying farms there are 19 crop acres to each work horse. There are about 4.4 acres of crops to each productive animal unit on the 10 better-paying farms and only 3.6 crop acres to each productive animal unit on the average of 52 farms. This ratio furnishes ample winter feed for stock and allows growing cash crops as well.

The question arises as to how soil fertility is maintained on these farms. If we assume that each animal unit produces one ton of manure a month we have 234 tons of manure produced (19.5x12=234). If now we assume that half of that is lost to the crop land because the animals are on pasture for 6 months we have left but 117 tons. Between 30 and 50 per cent of this will be lost in handling. Not more than 60 to 85 tons of manure will be put back on the crop land. Since most of the manure is spread from the wagon box with a fork the applications will be about 15 tons to the acre. At this rate 4 to 6 acres might be covered each year or 20 to 30 acres covered once in a five year rotation. But since the general practice at Hyde Park is to apply the manure to the sugar-beet and potato land and garden, each acre will get an application of about 30 tons every five years, or an average of 6 tons a year. With this practice some of the fields have grown beets each year for 8 to 10 years and the yields are as good if not better than when they began to grow the crop. No other fertilizer is used at Hyde Park.

Size of Farm Business.—There is no measure that is universally used as a standard in determining the size of farm business. When by size, capacity in contrast with efficiency is intended, the most accurate measure is the total cost of operating the farm business. This includes (1) cash paid out, (2) value of unpaid family labor, (3) value of the operator's labor, (4) interest on the capital investment, (5) all depreciation charges, and (6) any decrease in the inventory of feed and supplies(1). This measure of size has not been calculated for these records because in this study other measures serve the purpose better by being more suggestive. For this publication it is not necessary to have size so accurately measured because no attempt is made to determine the most profitable size of farm business. A number of other measures have been used that have considerable significance. In 1914 the average capital investment in the 52 farms was $13,642. The average farm receipts were $2,510. On the average the farms contained 105 acres, 54 of which were in crops. The average size of farm business in 1915 and 1916 did not differ greatly from that in 1914. (See Tables I and II in Appendix). Where the farm business was not sufficiently large some farmers increased the size by renting additional land as shown in Table III. Undoubtedly other farmers increased the size of the farm business unit which they operated by purchasing additional land and livestock. As a rule a farmer who has a small business realizes that he might make more money if his business were larger, but often he is incapable of overcoming all the obstacles to enlarging the business.

Some reasons for small farms here are revealed by the history of settlement. In the fall of 1859 Wm. Hyde (after whom the town was named), Simpson M. Molen, and Patterson D. Griffith, left Lehi, Utah County, for Cache County, for the purpose of obtaining farms and making home for their families. They arrived at the present site of Hyde Park, and found there a small creek flowing from the mountains which

(1)Spillman, W. J., U. S. D. A., Farm Management Cir. 1., (Jan. 1916), p. 13.

could be used for irrigating crops and for cullinary purposes. They used their squatters rights and staked out claims. After staking out their claims these three men returned to Lehi for the winter.

The exact number of acres first laid out is not known, but Wm. Hyde, son of the pioneer, estimated that not more than 50 acres were included in each farm as originally staked out. One reason for not taking larger farms was the scarcity of water. The little creek would not irrigate more land than was then included in the three claims. Dry-farming was unknown at that time and the possibilities of irrigation water being taken from Logan River were not then anticipated. Another reason is, that with the little machinery then in general use, 50 acres of irrigated land made a good family-sized farm.

In the spring of 1860 they returned to their claims to find that another party, of which Robert Daines was a member, had squatted on the same claims that the Lehi party had staked out the fall before. The difficulties which arose over this situation were amicably settled by dividing the land between the parties so that each farmer had from 10 to 25 acres. This was about all that he could take care of under the then existing conditions.

After the passage of the Homestead Act (1862) and the possibilities of obtaining irrigation water from the Logan River were appreciated, tracts of 160 acres were homesteaded. But few of these large units remain intact now. Most of them have been divided and redivided. Some parents desiring children to remain near home when they married and began for themselves gave a portion of the farm to each child. Other farms have been left as estates and consequently divided among the children and later each piece sold as a separate entity.

Other reasons why farms are not larger are the inability of the operators to handle a larger business because of old age, ill health, physical infirmities, lack of capital or credit, scarcity of labor, undependableness of farm labor, and inconvenience of having hired labor around the farm home.

At present it is common for a farm unit to be composed of 5 to 8 separate pieces of land which may be 1 to 3 miles apart from each other. This situation wastes labor but perhaps allowes greater diversity of farm enterprises as a partial compensation. The fact that farm families live in town and have the barns and chores in town wastes labor and reduces the acreage that a family can farm. In spite of these handicaps a fairly large farm business is done on the average farm at Hyde Park, and the labor income secured shows that the farmers are prosperous. (See paragraph on Farm Profits and Tables I and II in appendix).

Farm Machinery.—The machines used on the farms in this area are of modern type and construction. Irrigated grain is cut with self-binders and dry-farm grain either with self-binders or headers, and threshed by steam threshers. Mowing machines, self-dump hay-rakes, hay loaders, buck rakes, derricks, hay forks, hay nets, etc., are in general use. Most of the alfalfa is pitched on the wagon by hand and unloaded at the barn or stack with derrick and fork. No special potato or corn machinery is used, as these crops are not of sufficient importance to justify owning it. Most of the plowing is done with 1 and 2-bottom sulky plows. Some two way gangs and disk plows are used on the dry-farms. Usually three or more horses are used in plowing. However, some plowing on the irrigated farms is done with two horses and the walking plow. Sugar-beet seed is drilled in in the spring. The farmers usually pay the sugar manufacturing company $2.25 an acre for seed and $0.50 an acre for seeding, or $2.75 an acre for seed and seeding.

Table VIII.—Average Value of Farm Machinery, Hyde Park Farms, Cache County, Utah, 1914, 1915, and 1916.

	Value per Farm				Value per Crop Acre	
	3 Year Average	1914	1915	1916	1914	1915
Average of all 52 farms		$422			$7.81	
Average of all 48 farms			$469			$9.02
Average of all 32 farms	$421	407	461	$395		
Average of 10 best farms	479	531	489	416	5.06	7.76
Average of 10 poorest farms	408	444	405	374		7.94

The beets are cultivated with 1 and 2-horse beet cultivators and are plowed out in the fall with beet plows. Table VIII shows that the average value of machinery in this district is about $420 to the farm and ranges from $141 to $1,622 to the farm. There were $5 to $9 worth of machinery for each acre of crops. The more profitable farms have more machinery on each farm and less for each acre of crops than the average farm.

The average value of farm machinery on each farm in 7 areas in Utah in 1914 was $449(1). The farms with the larger amount of capital have a greater numerical amount but a less proportionate amount of it invested in machinery than do the farms with less capital. The value of machinery for each crop-acre is less and consequently machinery cost for each acre of crops is less on the large farms than on the small farms. The efficiency of farm machinery increases with an increase in the acres of crops(2).

The perfection of machinery causes great changes in the type of farming. As the cotton gin, threshing machine, and steel plow have made great changes possible, so may the perfected sugar-beet thinner and topper when developed.

Buildings.—The type of farming followed and the size of the farm business determine the kind and size of farm buildings required. The farm buildings at Hyde Park consist of dwelling house, cow and horse barn, milk house, small pig-pen, hen house, machine shed, and granary. On a few farms the cow barn is separate from the horse barn. Not all the farms have a milk house. The size of the milk house and cooling trough should be correlated directly with the number of cows milked and the care given the milk. The hen houses and machine sheds are usually very ordinary lumber structures. Since but a few hogs are kept a small hog-pen is all that is necessary. Some fairly large and well built granaries are found, some of which were constructed twenty-five or thirty years ago when wheat was raised on the irrigated land as a cash crop. Some of these are little used now but others are used for the dry-farm wheat, spring wheat, and oats.

It sometimes happens that the farm buildings determine the farm practice on a given farm at a given time. It has happened at Hyde Park, that because of insufficient storage space, grain and potatoes have of necessity been sold in the fall at harvest time, when if the storage space had been available they would have been held until winter or spring.

(1) Brossard, E. B., Utah Agr. Exp. Sta. Bul. No. 160, (Sept. 1917), p. 14, Table XI.

(2) Ibid., p. 35.

The value of the farm dwelling was estimated by the farmers on the basis of selling value as a home. The homes are not on the farms in this district and the two may easily be valued separately. The other buildings were estimated at sale value for the purpose for which they are being used or for any other use for which they are appropriate.

In 1914 only fifty of the fifty-two farms reported dwellings. The average value was $1,335. Dividing the total value of all dwellings reported by 52 gives $1,284. The average value of dwellings on 309 irrigated Utah farms in seven areas in 1914 was $1,056.(1) The average value of other buildings on the 309 farms mentioned above was $412. On the 309 farms the average value of buildings was $14 to each acre of land. The cost of livestock shelter is less on the large farms than on the small farms because of the greater number of livestock units kept. The larger farms have better dwellings and better barns than the smaller farms.

Climate.—The climate of Utah is the most important single factor determining the type of farming. Low precipitation makes a desert out of a strip along the western edge of Utah 50 miles wide and running north and south almost the entire length of the State. Lack of sufficient rainfall in the crop-growing season makes it necessary to irrigate in most parts of the State. Where irrigation water is scarce or unavailable and precipitation amounts to 12 inches or more, with other conditions favorable, dry-farming may be practised. There are perhaps 20,000,000 acres of land in the State that will never be cultivated because of poor climate. The climate, topography, and soil prevent the cultivation of millions of acres. The type of farming is of necessity adapted to the climatic conditions. Wheat and barley are important dry-farm crops because they are successfully grown with slight precipitation. Alfalfa is well adapted to dry climates where irrigation is practised and is ideally grown where, with other conditions satisfactory, the dry, hot, rainless days make it easy to harvest the hay.

At Hyde Park(2) the mean annual precipitation is 16 inches (See Figs. 2 and 3), 7 inches of which fall during the six months from April to September, (See Fig. 4). The lowest and highest annual precipitation recorded are 13 inches and 26 inches, respectively. There are 62 days annually with 0.01 inch or more precipitation. The average mean annual temperature is 47.6° F. with a mean difference between night and day of 21.9° F.(3), (See Fig. 5). The average number of days in the growing season, between spring and fall killing frosts, is 151, (See Fig. 6). The dates of the average and absolute last killing frost in the spring and the average and absolute first killing frost in the fall are May 10 and June 17, and October 8 and September 14, respectively. The average and absolute hottest days in the summer are 95° F. and 100° F., respectively, while the average and absolute coldest days in winter are -11° F. and -19° F., respectively. The mean temperature for January, the coldest month of the year, is 24.4° F., and for July, the warmest month of the year, 71.5° F. The annual rate of evaporation from a free water surface is 45 to 55 inches. The mean humidity during the day is about 50 per cent, (See Figs. 7 to 12, inclusive).

Topography.—Farming by irrigation is especially dependent on topography. The Hyde Park farm land slopes gently from the mountains west toward the center of the valley. This facilitates irrigation

(1) Brossard, E. B., Utah Exp. Sta. Bul. No. 160, (Sept., 1917), p. 14.

(2) There is no weather station at Hyde Park. The data given here are recorded by the U. S. Weather Bureau for Logan, which is 4½ miles south.

(3) West, F. L. and Edlefsen, N. E. Utah Exp. Sta. Bul. No. 166, (March, 1919), p. 9.

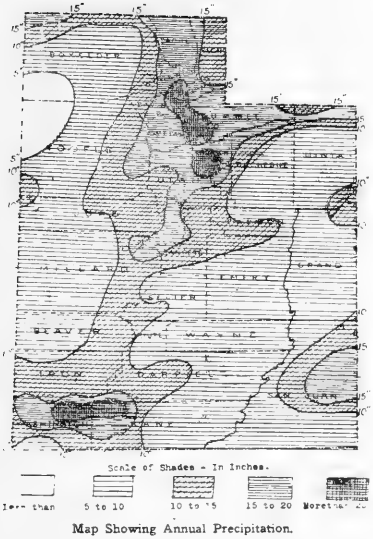

Fig. 2.—Average Annual Precipitation, Utah.
(U. S. D. A., Weather Bureau)

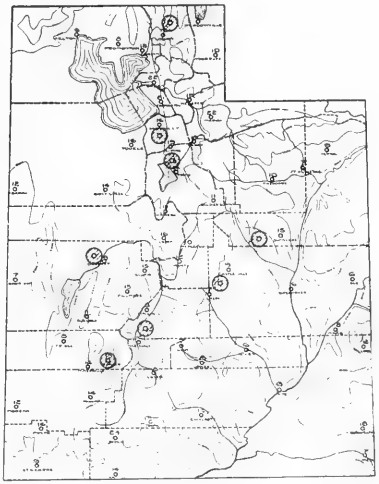

Fig. 3.—Average Annual Precipitation in inches in areas investigated, Utah.

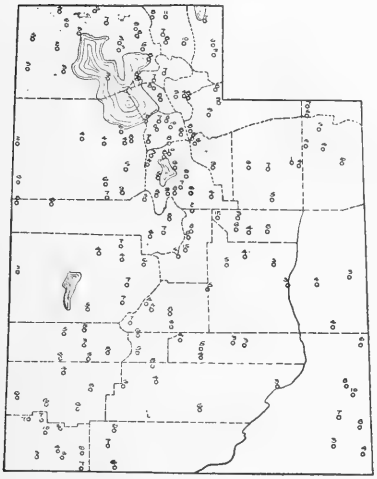

Fig. 4.—Average Precipitation in Crop Growing Season, Utah.

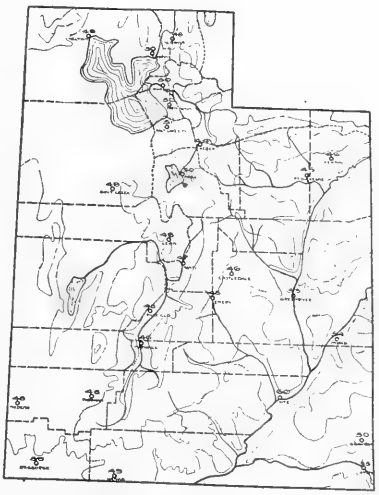

Fig. 5.—Mean Annual Temperature, Utah.

on most of the land, but on some farms the slope is excessive for the best irrigation. The meadows and pastures on the west side of the State road are level and wet where low lying, but dry where the land is slightly elevated or rolling. The arable land is easily worked with the improved machinery. The farmers of Hyde Park who have dry-

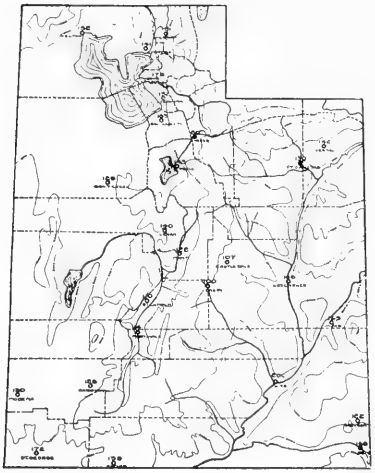

Fig 6.—Average Days in Crop Growing Season, Utah.

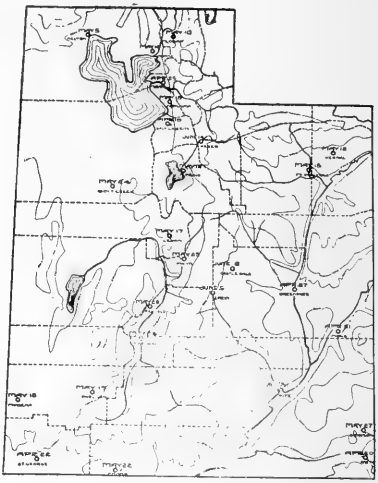

Fig. 7.—Average Date of Last Killing Frost in Spring, Utah.

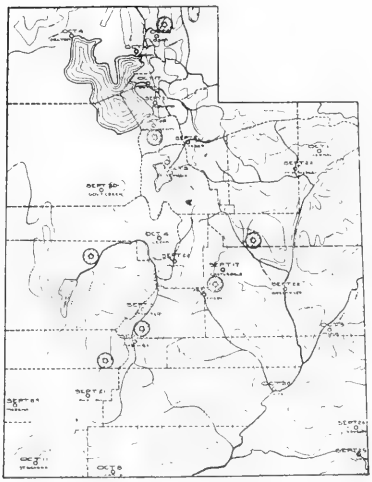

Fig. 8.—Average Date of First Killing Frost in Autumn, Utah.

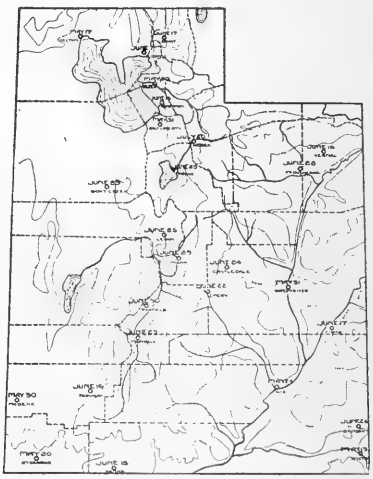

Fig. 9.—Latest Date of Killing Frost in Spring, Utah.

stock or beef cattle, usually graze them east of town on the range afforded by the Cache National Forest. Some, however, who have an abundance of meadow-pasture that is too wet or too dry for other uses, keep the dry-stock at home on these pastures.

In a general way topography determines the type of farming practised thruout a very large part of the State of Utah. The topographical

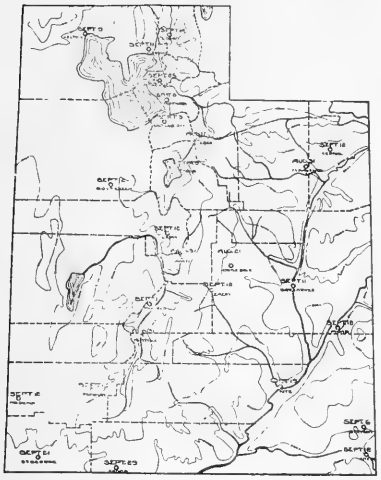

Fig. 10.—Earliest Date of Killing Frost in Autumn, Utah.

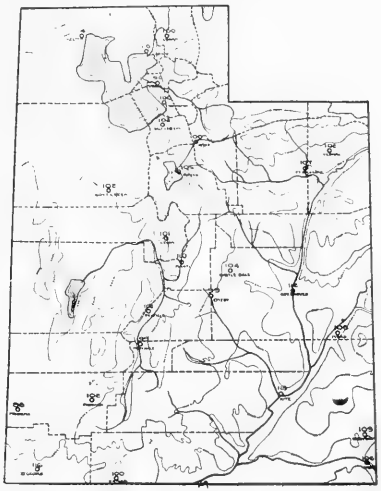

Fig. 11.—Highest Temperatures Recorded, Utah.

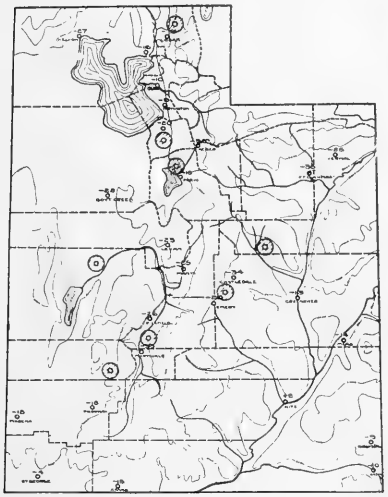

Fig. 12.—Lowest Temperatures Recorded, Utah.

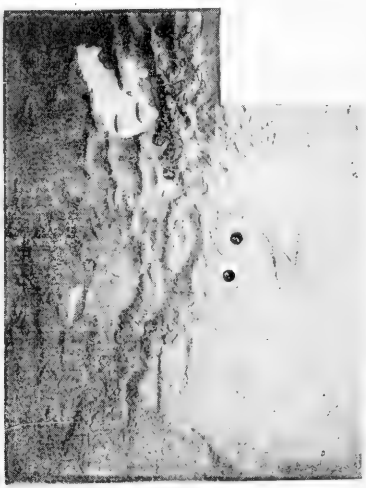

Fig. 13.—Mountains, Valleys, Lakes, and Streams, Utah. (Dept. of Geology, U. A. C.)

map, Figure 13, shows the mountains and the valleys of the State. The mountains are not likely ever to be cultivated. This eliminates approximately 40 per cent of the entire State from cultivation. The only agricultural use for this vast area of about 20,000,000 acres is grazing livestock. On farms conveniently situated this tends to establish a type of farming based upon the grazing of livestock and makes the

agricultural value of the ranges dependent upon their productivity as grazing lands. It is probable, because of these and other conditions that the livestock enterprises will be of greater importance in the future than in the past(1). Especially will this be true on farms conveniently situated.

Soil.—Table IX gives a description of the Hyde Park soil types and the number of farms reporting each type. The descriptions are those given by the farmers themselves and are therefore not technical.

Table IX.—Soil Types and Farms Reporting, 52 Hyde Park Farms, Cache County, Utah.

Description	Farms Reporting
1. Clay Loam	21
2. Black Loam	10
3. Sandy Loam	10
4. Gravelly Loam	10
5. Clay	5
6. Black Clay Loam	3
7. Loam	2
8. Sandy Clay Loam	2
9. Clay and Gravelly Loam	2
10. Gravelly Clay Loam	2
11. Gravelly Clay Sandy Loam	2
12. Gravel	1

There is a great variety of soil types as described by the farmers. The soil on any one farm may vary from heavy clay to coarse gravel. These conditions are typical of the entire Cache Valley.

All of the farming lands of Cache County are in the Bonneville beds(2). (See Figures 14, 15, and 16). The soils were formed from sediments deposited from this ancient lake. Since its subsidence they have been considerably modified by inflowing streams and by weathering. The soils vary from gravel, small gravel and light sand thru all grades to the heaviest and most tenacious clays. The upper benches of the deltas around the mouths of the canyons, and also the shore benches of Lake Bonneville, are covered with gravelly soils grading down into coarse gravel. These soils are well underdrained and therefore free from an excess of salts, but owing to the thinness of the soil proper; and to the difficulty of applying water and cultivating the soil, they were but little farmed until about 20 years ago. Since that time these soils have proved very productive both under irrigation and with dry-farm methods. The soils of the lower benches contain less gravel, but are sandy and of light texture.

Upon the lower and more level parts of the valley there are great variations in the soils. In those parts farthest from the inflowing streams, where the water movement was slow, the soils are heavy and often contain as high as 50 per cent of clay. Nearer the mouths of streams, where the water movement was more rapid, the soils are noticeably lighter, grading thru loam, sandy loam, sandy, or gravelly. Irrigation on the loose soils results in the transportation of considerable salt to the lower and heavier soils, where it is most difficult to get rid of. In Cache Valley there is a large area of wet clay-land which is

(1) Barnes, W. C., and Jardine, J. T., U. S. D. A., Office of Secretary. Rpt. No. 110, (July, 1916), pp. 13 to 15.

(2) Means, Thomas H., U. S. D. A., Bur. of Soils, Field Operations. (1899).

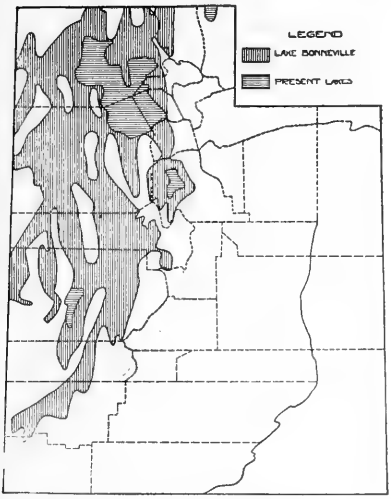

Fig. 14.—Extent of Old Lake Bonneville in Utah, where Soils of the Great Interior Basin Originated. (after J. A. Widtsoe)

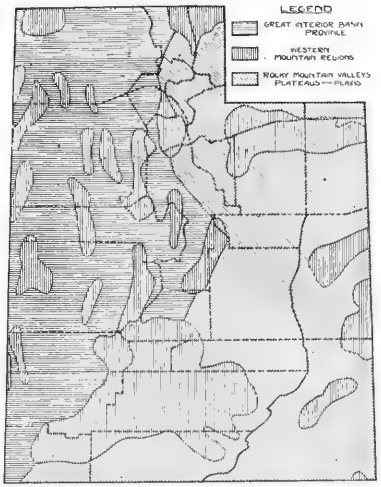

Fig. 15.—Three General Soil Provinces in Utah. (after Milton Whitney)

used for meadow and grazing, the value of which could be much enhanced by drainage and cultivation. Both black and white alkali are present in limited spots in the west-central part of the valley. The black alkali is always associated with the white alkali. Irrigation and seepage waters are the sources of these alkali spots.

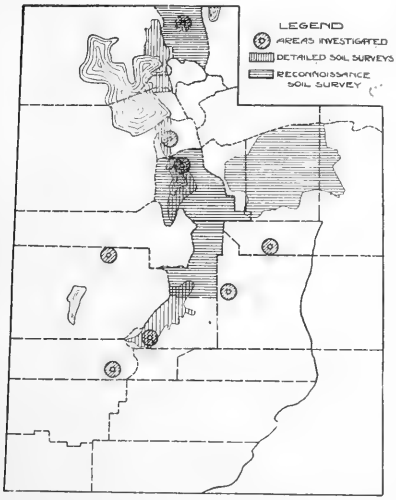

Fig. 16.—Soil Surveys in Utah.

National Forests and Public Stock Ranges.—The control of grazing on the national forests by the Federal Government has been a benefit to the livestock business and farming in general and thus to the country as a whole. But when the act was passed creating the National Forests, it was not known that it would, (1) eliminate free competition in the use of grazing lands, (2) establish a privileged class of farmers, and (3) determine the type of farming on many farms adjacent to the reservations. Yet this is what has happened. This situation is admitted but at present no good solution of the problem is advanced.

The Cache National Forest borders the dry-farm land east of Hyde Park and includes the mountains. (See Figure 17). In 1916 there were 833,898 acres of land within its boundaries, 319,581 acres of which were in Utah and 514,317 acres in Idaho(1). Of the 319,581 acres in Utah,

(1)Kneipp, L. F., Third Annual Rpt. Utah Bu. Immigration, Labor, and Statistics, (1916), pp. 184-5, "Utah's Forest Resources."

52,515 were private lands within the forest and 267,066 acres were the net national forest lands.

The average grazing season is 5 to 8 months long. On the average, for the three years 1914, 1915, and 1916, there were 21,750 head of cattle and horses, and 132,467 sheep and goats grazed on the 833,898 acres less the privately owned land in both Utah and Idaho. In other words there are 40,674 animal units grazed here, or 1 animal unit to about 17 acres. This is the estimated grazing capacity of the forest(1). This shows that the Cache National Forest is now grazed to its capacity.

Farmers who had stock to put on the ranges at the beginning of regulation have the prior right today. They are desirous of increasing the number allowed them under their permits. New farmers want to get stock on the ranges. This is difficult. In order to do so they must get a permit from the Federal Government. There are three ways of obtaining permits: (1) buy one from some farmer at the same time as you buy his farm; (2) wait your turn until some one goes out of the business, or so reduces his herd as to allow other animals on the range; or (3) await the improvement of the range, by the regulations of the Federal Government, so that its capacity is increased. By either the second or third method, but few stock may be added at a time, and in most cases it is poor economy to have so few head on the range.

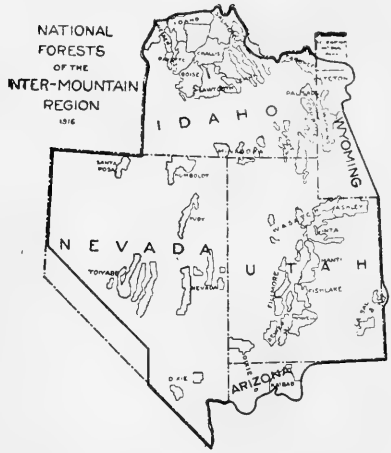

Fig. 17.—National Forests of Intermountain Region. (after L. F. Kneipp)

The deciding who shall have stock on the ranges, and how many each shall have, is a function of the District Forester, who is an official of the Federal Government. This may or may not be a good thing. In the past it has undoubtedly been a benefit. But all that it is necessary to point out here is that the Federal Government thus becomes a very important factor in determining the type of farming on the farms of the Intermountain States. This is particularly true in Utah and especially in Cache County and Hyde Park.

Table X shows the value of all domestic animals on farms and ranges by counties in Utah, April 15, 1910. A comparison of Table X and Figure 17, giving the location of the National Forests, shows that more livestock are kept in the districts where the ranges are located.

Population.—From the early settlement at Salt Lake City (1847) others soon developed both north and south wherever irrigation water was available and the soil and climate made agriculture possible. (See Figure 18). The settlement of Hyde Park began in 1860 or about 60 years ago. The climate of Hyde Park is delightful because of the light and infrequent rains, the clear and sunshiny days, the dry ground underfoot, the dry air, and the mild wind with a velocity of but five miles an hour. While these factors contribute to a pleasant and agreeable habitat for man, at the same time they make it necessary to irrigate most of the crops of Cache County and the State and make vegetation light where irrigation is impossible.

(1) Barnes, Will C., and Jardine, J. T., U. S. D. A., Office of Sec., Rpt. No. 110, (July, 1916), p. 87.

Table X.—Value of all Domestic Animals on Farms and Ranges, by Counties, Utah, April 15, 1910(1)

Area	Value	Area	Value
State	$28,330,215	State	$28,330,215
County		**County**	
1. Utah	$ 2,313,981	15. Summit	$ 886,029
2. Sanpete	2,281,140	16. Grand	864,538
3. Boxelder	2,230,539	17. Davis	817,654
4. Cache	1,975,257	18. Juab	804,834
5. Salt Lake	1,639,631	19. Washington	794,334
6. Wasatch	1,388,374	20. Kane	724,925
7. Sevier	1,301,279	21. Emery	698,236
8. Iron	1,210,637	22. Tooele	592,914
9. Garfield	1,033,687	23. Wayne	521,722
10. Rich	992,966	24. Beaver	516,365
11. Weber	950,804	25. Carbon	429,188
12. Millard	934,760	26. Morgan	357,546
13. San Juan	910,517	27. Piute	263,460
14. Uinta	894,898		

Hyde Park had a population of 699 according to the 1910 census. The character of its population is assumed to be about the same as of Cache County as given by the 1910 United States census.

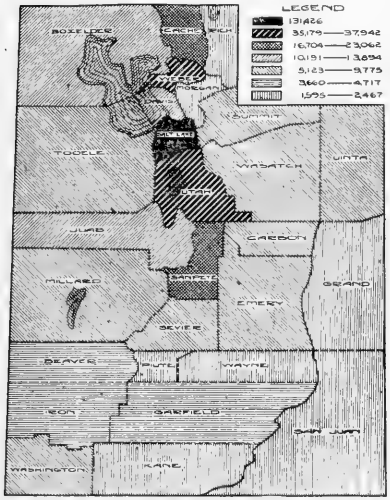

Fig. 18.—Distribution of Population by Counties, Utah. (1910 U. S. Census)

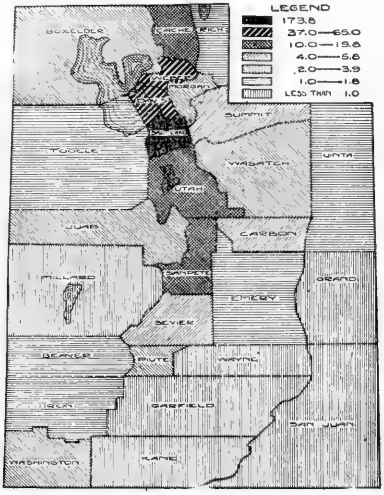

Fig. 19.—Density of Population (Persons per sq. mi.) by Counties, Utah. (1910 U. S. Census).

The population for Cache County was 23,062 in 1910; 18,139 in 1900; 15,509 in 1890; 12,562 in 1880; 8,229 in 1870; and 2,605 in 1860. In 1910 there were 11,458 males and 11,604 females in the

(1)1910 U. S. Census.

county. There were 19.8 persons per square mile. But the density of the rural population was 13.4 persons per square mile. (See Figure 19).

Of the total population 46.3 per cent was urban and 53.7 per cent was rural. There were only 64 colored people in the county, 7 of whom were negroes, 5 males and 2 females, and 57 indians, chinese, japanese, and all others.

There were 5,230 males of voting age, 64 of whom were illiterate, or 1.2 per cent. Of all persons 10 years old and over, 215, or 1.3 per cent were illiterate. There were 8,399 persons, 6 to 20 years old inclusive, 5,982 of whom, or 71.2 per cent were attending school. There were 9,800 native whites of native parentage, 9,421 native whites of foreign or mixed parentage, and 3,777 foreign-born whites. Of the 3,777 foreign-born whites in the county, 979 came from England, 825 from Denmark, 651 from Sweden, 405 from Switzerland, 272 from Norway, 201 from Germany, 149 from Scotland, 127 from Wales, 42 from Canada, 32 from Italy, 18 from Ireland, 14 from Australia, 9 from Greece, 9 from Mexico, 8 from Russia, 5 from Austria, 4 from Finland, 2 from France, 2 from Holland, 1 from Hungary, and 22 from other foreign countries such as Japan, China, India, etc.

There were 4,125 native whites both of whose parents were born in the same foreign country. The parents of 1,463 of these native whites came from England, 1,019 from Denmark, 556 from Sweden, 325 from Switzerland, 225 from Norway, 221 from Scotland, 148 from Wales, 111 from Germany, 23 from Italy, 11 from Canada, 11 from Ireland, 6 from Russia, 3 from France, and 3 from Holland.

It should be noted that most of the foreign-born whites and also the parents of the native-born whites of foreign parentage came from Great Britain and the countries of northwestern Europe. The people of these countries are usually industrious and thrifty. The type of farming practised in these foreign countries is similar in many ways to that practised at Hyde Park. The root crops, especially sugar-beets, were no doubt familiar to these persons before they came to this country. These persons were also undoubtedly familiar in some degree with the small-grains and hay. They also knew something about machine methods in general farming. These conditions had some influence on their settling at Hyde Park and the type of farming followed there.

Between 15 and 20 per cent of the rural male population of the

Table XI.—Size of Family, Acres Sugar-Beets Raised, and Cows Milked, Hyde Park, Cache County, Utah, 1914

Size of Farm Family(1)	Number of farms in group	Average number of persons per family	Average age of farm operators (years)	Number of farms raising beets	Average acres beets per farm	Number of farms with milk cows	Average number cows per farm
All Farms	45	7.4	45	41	10.4	43	7.4
Small	16	4.6	44	15	8.3	15	6.0
Medium	17	7.7	43	15	9.2	16	7.1
Large	12	10.6	48	11	13.9	12	9.6

(1)The Small Farm Families had from 2 to 6.9 members, the Medium Farm Families had from 7 to 8.9 members, and the Large Farm Families included those having from 9 to 14 persons each.

State are foreign-born whites and therefore in studying the type of farming and its causes this factor should not be neglected. In 1910 the total rural population of the State was 200,417, males 107,810 and females 92,607. There were 86,273 native-white males and 79,427 native-white females, and 18,358 foreign-born white males and 11,641 foreign-born white females. There were only 118 negro males and 67 negro females in the State, and 1,661 indian males and 1,441 indian females. Forty-eight and three-tenths per cent of all rural males were under 20 years of age and 48.1 per cent of all rural males were between the ages of 20 and 64 years. Fifty-four and three-tenths per cent of all rural females were less than 20 years old.

The Farm Family.—The Hyde Park farms are family-sized farms. One manager is all that is required on any of them and he does the greater part of the farm work. There is only one farm on which there is a man hired for the entire year. Most of the farm labor is performed either by the farmer himself, unpaid family labor, or is hired by the month, day, or piece as needed during critical or rush seasons of the year.

There were 4,623 families in Cache County in 1910(1) and 4,430 dwellings, or 104 families to each 100 dwellings. The average number of persons in a family was 5, and the average number in a dwelling 5.2. For the State the average number of persons in a family was 4.8, and the average number in a dwelling 5.1, as compared with 4.5 and 5.2 persons in each family and in each dwelling respectively in the United States. The families are larger in Cache County than the average of the State, and the average of the State is larger than the average of the United States.

The average number of persons in the farm families included in this investigation in 1914 is 7.4, but only 6 of these persons were on the farm at the time it was visited. Hyde Park farm families are larger than the average Cache County farm family. The raising of children well is a part of the mission of every married couple according to the religious teaching of most of these farmers. Babies are most welcome in these farm homes. Consequently a type of farming is adopted that makes it possible to raise numerous children. Children while young are able to milk cows and thin sugar-beets to good advantage and thus contribute to the family income and help make their own living. Table XI shows that on those farms with the large families more acres of sugar-beets are raised and more milk cows are kept than on the farms with small families. The type of farming practised seems to have a definite relationship to the size of the farm family.

Table XII does not show a marked correlation between size of farm family and labor income, because unpaid family labor has been subtracted as an expense in determining this figure. There is, however, a marked correlation between the size of family and crop acres, farm income, value of unpaid family labor, and family income. These facts indicate that the entire farm family is the basic unit around which the farm business is organized.

Farmers, like the other factors of production, land and capital, have two dimensions of productivity, capacity and efficiency(2). The farm home is one of the factors that contributes to the productivity of the farmer. The converse of this is also true. The productivity of the farmer largely determines his type of farm home. These two factors affect each other in such a way as to be called reciprocating factors. The farmer being born in a home is first affected by the home and sub-

(1)1910 United States Census.

(2)Taylor, H. C., Am. Econ. Rev. Supp. Vol. VII, No. 1, (March) 1917). "Two Dimensions of Productivity."

Table XII.—Size of Farm Family, Labor Income(1), Value of Unpaid Family Labor(2), Farm Income(3), and Family Income(4), Hyde Park, Cache County, Utah, 1914

Size of Farm Family	Average Age of Farm Operators (years)	Crop Acres Per Farm	Labor Income	No. Farms Having Unpaid Family Labor	Value of Unpaid Family Labor	Farm Income	Family Income
Small	44	39	$ 600	6	$126	$1,066	$1,192
Medium ..	43	50	1,156	14	246	1,833	2,076
Large	48	77	897	12	414	1,898	2,312

(1)Labor income was obtained by subtracting from the farm receipts, the farm expenses and interest on the average capital investment. Interest in this case was figured at 5 per cent but should have been figured at 8 per cent. (See paragraph on Farm Profits). The value of hired labor was counted as an expense but no personal or living expenses were counted. If the farmer's sons or other members of the family did farm work without pay, their labor was counted as an expense and rated at what they would have received had they worked for their neighbors, or what it would have cost to have hired the work they did. Any increase in stock, feed, or other inventory items was counted as a receipt; a decrease was counted as an expense. Any increase in the value of land which might be thought of as unearned increment was not included as a receipt, but increases in land values due to improvements have been counted as receipts and the amount of the increase allowed was the same as the expense of the improvement. No credit has been allowed for the farm products that were used in the farm home. The farm house has been considered as part of the farm capital investment.

(2)The value of unpaid family labor was estimated on the basis of wages paid by neighbors for similar work and workmen and also on the basis of what it would cost to hire the same work done on the farm in question. The child labor employed doing chores was not included when the tasks they performed would have been done by their father or some other member of the family, had they not been performed by the smaller children. No charge in farm expenses was made for child labor that just relieved the father or older brother from some menial task which they would have done themselves rather than hire it done. No charge for child labor should be made unless there is an actual opportunity value for the labor and then the charge should be made on the basis of the opportunity value. But sometimes it is difficult to estimate this opportunity value. Such cases arose at Hyde Park and the unpaid family labor was valued on the basis of what it would cost the individual farmer to hire such work done. It is evident that in either case the information rests on estimates. In the one case one estimates the amount of labor each child or grown boy or girl does, and in the other case he estimates the opportunity value of the labor at the given time.

(3)Farm income was obtained by subtracting the farm expenses from the farm receipts. It is labor income plus interest.

(4)Family income is the sum of the farm income and the value of unpaid family labor. It does not include the farm produce used in the house, house rent, or unearned increase in land value.

sequently his own personal productivity affects his home. Table XIII shows the great variation in the value of the dwellings of the Hyde Park farmers. Two-thirds of these farm dwellings are valued at $1000 and over and one-third of them are worth less than $1,000.

Table XIII.—Value of Farm Dwellings, 50 Farms, Hyde Park, Cache County, Utah, 1914

Range of Value of Farmhouse	Number of Farms
$100 to $4,000	50
500 or less	10
501 to $ 999	7
1,000 to 1,499	11
1,500 to 1,999	8
2,000 to 2,499	9
2,500 or over	5

Table XIV.—Relation of Value of Farm Home and Labor Income, Hyde Park, Cache County, Utah, 1914

Group of Farms According to Value of Farm Home	Number of Farms in Group	Average Value of Farm Home	Average Labor Income	Average Farm Income
All Farms	49	$1321	$863	$1537
$100 to $1000	17	479	914	1462
$1000 to $2000	19	1274	806	1455
$2000 and over	13	2492	880	1753

Table XV.—Relation of Value of Farm Home and Labor Income, Hyde Park, Cache County, Utah, 1914

Group of Farms According to Value of Farm Home	Number of Farms in Group	Average Value of Farm Home	Average Labor Income	Average Farm Income
All Farms	49	$1321	$863	$1537
$100 to $800	14	410	961	1446
$800 to $1500	14	1000	796	1498
$1500 and over	21	2029	848	1623

Table XVI.—Relation of Value of Farm Home and Labor Income, Hyde Park, Cache County, Utah, 1914

Group of Farms According to Value of Farm Home	Number of Farms in Group	Average Value of Farm Home	Average Labor Income	Average Farm Income
All Farms	49	$1321	$863	$1537
$100 to $1200	25	646	909	1510
$1200 to $2000	11	1473	739	1249
$2000 and over	13	2492	880	1753

Altho it may seem reasonable to expect that farmers who make the largest labor incomes should have the more expensive homes, or that the farmers who have the more expensive homes should make the largest labor incomes, yet Tables XIV, XV, and XVI show that there is in reality no correlation between the value of the farm dwelling and the farmer's labor income. This illustrates how easily one may be mistaken in judging the prosperity of a farmer by the size and elegance of his dwelling house.

Farm Labor.—It has been shown how family labor affects type of farming. Hired labor is also a determining element. At Hyde Park, in 1914, the average amount of labor employed on each farm was equivalent to 1.6 men, including the farm operator. This is equivalent to 1 man, the operator, twelve months (1 year), and 7 months and 6 days of additional man labor. In 1915 the average number of men on the 48 Hyde Park farms was 1.6 and on the 10 better-paying farms 1.5.

In 1914 there were 11 farmers who hired help by the month. Only 1 of these farms hired a man by the year. On the average, annual wages for month-help on each farm amounted to $230. Nine farms boarded help at least part of the time, the estimated average cost of which amounted to $55. Thirty-three farmers hired extra help (paid by month, day, or piece) during the rush season, usually thinning beets, hoeing or harvesting beets, or harvesting grain or hay, the cost of which averaged $128 for each farm. Thirty-two farms had, on the average, $286 worth of unpaid family labor. Including all farms of the area, the average value for each farm, of regular hired labor, extra labor, board of hired labor, and unpaid family labor, was $387. The farmers' estimates(1) of the value of their own labor for the year varied from $200 to $1,000, and averaged $600. Therefore, the average value of all labor on each farm, in 1914, was $600 plus $387, or $987. The average amount paid for hired labor in 1916 on the 32 farms at Hyde Park was $127. Unpaid family labor averaged $87. The total value of labor other than the operator's, was, therefore, $214 as compared with $387 in 1914.

The hoeing and cultivating of beets begins about two or three weeks after thinning. Beets are hoed from three to seven times during the season. They are irrigated from two to seven times a season, altho if done at the proper season, three to four times are sufficient(2). The hoeing and cultivating is usually done just after irrigation. The plowing on dry-farms is usually done as early in the fall as possible after the grain is taken off.

The critical labor periods in the type of farming practised at Hyde Park are during beet thinning, fall plowing, fall planting, and beet pulling. The summer care of beets and potatoes conflicts as does also the planting of the commercial potatoes and the thinning of sugar-beets in the spring. This is one reason why more potatoes are not grown here. When alfalfa or other hay is ready to cut the beet work stops and haying begins. The beet work is resumed as soon as the hay is up. As nearly as possible the irrigating is done when the crops need water. Sometimes both the beets and the alfalfa need it at the same time and thus a critical labor situation may arise in irrigating. As a general rule, the labor on these crops is not conflicting as to time that it should be done. (See Table XVII). The labor on the livestock and the crops

(1) Based upon what he could hire out for to some one else. Some had had offers of positions and others estimated according to wages paid for labor they were able to perform.

(2) Harris, F. S., Utah Agr. Exp. Sta. Bul. No. 156, (June, 1917).

Table XVII.—Order of Crop Work at Hyde Park, Cache County, Utah(1)

1.	April 1 to 10	Planting sugar-beets
2.	April 2 to 20	Planting spring wheat
3.	April 5 to 15	Planting early potatoes
4.	April 10 to 20	Planting spring oats
5.	April 20 to 30	Planting corn
6.	May 20 to 30	Planting commercial potatoes
7.	May 20 to 30	Thinning sugar-beets
8.	June 15	Irrigating sugar-beets begins
9.	June 20	Cutting first crop of alfalfa
10.	July 1	Cutting timothy and clover begins
11.	July 6	Digging early potatoes (grown for home use only)
12.	July 15	Harvesting winter wheat begins
13.	July 15 to 30	Harvesting winter wheat general
14.	August 1 to 10	Cutting second crop of alfalfa
15.	August 5 to 30	Harvesting spring oats
16.	Aug. 10 to Sept. 15	Harvesting spring wheat
17.	Sept. 15	Seeding winter wheat begins
18.	Sept. 25	Pulling sugar-beets begins
19.	Oct. 6	Digging commercial potatoes begins

is largely non-competitive. The crop and stock enterprises are complimentary(2) to a considerable extent.

It is not at all necessary that the farming business be so organized as to have the same labor requirements for each month of the year. In winter, children are in school, high school, and college, but in summer they are at home and available for farm work. Growing sugar-beets at Hyde Park supplies profitable employment for this seasonal supply of farm labor. The school children of Logan and the smaller towns of the county do much of the labor on the sugar-beet crop of Cache County.

Man labor efficiency is indicated by the ratio of men to crop-acres and units of livestock. In 1914 the ratio of men to crop-acres was 1 to 33 on the average of all 52 farms and 1 to 52 on the 10 better-paying farms. In 1915 the ratio was 1 to 33 on the average of all 48 farms, 1 to 31 on the average of the 10 least-profitable farms, and 1 to 42 on the average of the 10 better-paying farms. It must be remembered in this connection that the men who cared for the greater number of acres of crops were operating farms larger than the average.

The ratio of men to productive animal units was 1 to 9 on the average of all 52 farms in 1914 and 1 to 12 on the average of the 10 better-paying farms. In 1915 this ratio was 1 to 10 on the average of all 48 farms, 1 to 10 on the average of the 10 least-profitable farms, and 1 to 14 on the average of the 10 better-paying farms. (See Tables I and II in Appendix).

The paragraphs immediately preceding have shown the amount of hired labor used, the average cost of hired labor, the seasonal requirements of labor, the critical labor periods, the labor conflicts on crop and stock enterprises, the immediately available supply of labor, and the efficiency of man labor with crops and stock on the Hyde Park farms. In Tables XVIII, XIX and XX, which follow, some of these factors are given for the State as a whole and for the individual counties in order

(1)Baker, O. E., and others, U. S. D. A. Yearbook, (1917), pp. 537 to 591, or Yearbook Separate No. 758.

(2)Connor, L. G., Utah Exp. Sta. Bul. No. 165, (Oct., 1918), p. 21, Table XVII.

to indicate roughly the general farm labor situation. Table XVIII shows the number and occupation of all males and females 10 years of age or over engaged in agriculture in Utah in 1910. In the order of numbers employed in agriculture the occupation classes rank as follows: (1) Farmers and Dairy Farmers, males 7,606, females 479; (2) Farm and Dairy Farm Laborers working out, males 7,807, females 255; (3) Farm Laborers, home farm, 5,827; (4) Stock Herders, Drovers, and Feeders, 2,207; (5) Stock Raisers, 1,350; (6) Gardeners, 398; (7)

Table XVIII.—Persons 10 Years of Age or Over, Engaged in Agriculture in Utah, 1910(1)

Occupation(2)	Total	10-13 Years	14-15 Years	16-20 Years	21-44 Years	45 and Over
Males	35,876	914	1,183	5,490	18,443	9,837
Farmers and Dairy Farmers	17,606	.....	.....	207	9,687	7,712
Farm and Dairy Farm Laborers (Working out)	7,807	147	304	2,065	4,383	908
Farm Laborers (Home Farm)	5,827	743	826	2,675	1,499	84
Stock Herders, Drovers, and Feeders	2,207	17	36	458	1,560	136
Stock Raisers	1,350	.....	.....	24	861	465
Gardeners	398	.....	.....	5	140	244
Fruit Growers and Nurserymen	313	.....	.....	1	145	167
Garden Laborers	228	5	12	25	82	103
Orchard and Nursery Laborers	140	1	5	30	86	18
Females	734	34	29	66	202	403
Farm and Dairy Farm Laborers	255	34	29	61	72	59
Farmers and Dairy Farmers	479	.....	.....	5	130	344

(1)1910 U. S. Census, Vol. IV., Population-Occupation Statistics, Table VII, p. 523.

(2)Ibid.

(a) A Farmer—A person who is in charge of a farm whether he owns it or operates it as a tenant, renter, or cropper.

(b) A Farm Manager—A person who manages a farm for some one else for wages or salary.

(c) A Farm Laborer—A person who works on a farm for someone else but not as a manager, tenant, or cropper.

(d) A Woman Farmer—A woman who herself operates or runs a farm.

(e) A Woman Farm Laborer—A woman working regularly at outdoor farm work, even though she works on the home farm for her husband, son, or other relatives, and does not receive money wages. Women farm laborers are separated into two classes: (1) those working on the 'home farm', and (2) those 'working out'.

(f) Children on Farms—Children who work for their own parents on a farm are classed as Farm Laborers on Home farm; but children who work on a farm for others are classed as Farm Laborers working out.

Fruit Growers, and Nurserymen, 313; (8) Garden Laborers, 228; and (9) Orchard and Nursery Laborers, 140. A total of 35,876 males and 734 females or a grand total of 36,610 persons 10 years old or over were gainfully employed in agriculture in Utah in 1910, which is 1 for each 10.2 persons in the State.

Table XIX.—Average Cost of Hired Labor on Farms, by Counties, Utah, 1910(1)

	Cash Expended per Farm	Rent and Board Furnished per Farm	Cash, Rent, and Board Furnished per Farm
The State	$242.58	$ 25.94	$268.52
Beaver	179.94	33.60	213.54
Boxelder	413.73	40.75	454.48
Cache	197.32	20.16	217.48
Carbon	309.97	58.92	368.89
Davis	211.22	24.40	235.62
Emery	270.15	82.84	352.99
Garfield	191.65	2.56	194.21
Grand	645.46	218.35	863.81
Iron	400.47	33.08	433.55
Juab	253.23	14.44	267.67
Kane	507.29	5.77	513.06
Millard	223.20	23.31	246.51
Morgan	187.25	19.31	206.56
Piute	227.09	34.11	261.20
Rich	774.00	206.11	980.11
Salt Lake	228.87	15.24	244.11
San Juan	553.84	157.08	710.92
Sanpete	173.63	13.20	186.83
Sevier	165.56	21.66	187.22
Summit	421.78	68.96	490.74
Tooele	324.02	54.30	378.32
Uinta	212.16	48.15	260.31
Utah	187.93	10.91	198.84
Wasatch	182.06	21.88	203.94
Washington	193.82	16.23	210.05
Wayne	168.66	38.91	207.57
Weber	222.70	14.74	247.44

Table XIX shows the average amount expended on each farm for hired labor, for each county in Utah, 1910(1). In Cache county an average of $217.48 was expended as wages, rent, and board for hired help. This is about the same amount as was expended at Hyde Park in 1916.

Table XX shows the monthly and daily wages of farm labor, with and without board, in Utah from 1866 to 1918. By comparing the wages given in this table for farm labor and the wages of farm laborers for the United States as a whole one finds that on the average they are higher in Utah(2).

(1)1910 U. S. Census.
(2)U. S. D. A. Monthly Crop Report, (Dec., 1918), p. 146.

Table XX.—Wages of Farm Labor in Utah(1), 1866-1918

Year	Average Monthly Wages for Year or Season		Average Daily Wages in Harvest		Average Daily Wages Other Than Harvest	
	Without Board	With Board	Without Board	With Board	Without Board	With Board
1866	$44.71	$26.32	$ 3.42	$ 2.49	$ 2.27	$ 1.63
1875	35.50	25.33	2.20	1.75	1.80	1.40
1879	28.87	20.50	1.82	1.43	1.46	1.12
1882	.....	.....	.....	.....	1.57	1.10
1885	30.00	21.00	2.00	1.56	1.52	1.14
1888	33.50	22.30	1.75	1.36	1.42	1.10
1890	32.30	21.00	1.72	1.30	1.38	1.05
1892	33.50	22.30	1.70	1.27	1.40	1.08
1893	33.29	24.65	1.80	1.43	1.28	1.06
1894	29.98	21.16	1.48	1.22	1.14	.92
1895	29.81	21.00	1.32	1.07	1.18	.90
1898	32.97	24.41	1.34	1.05	1.39	1.10
1899	34.43	25.72	1.57	1.29	1.48	1.22
1902	37.99	29.45	1.64	1.36	1.61	1.28
1909(2)	56.12	40.77	1.92	1.52	.....	1.61
1910(3)	47.50	35.00	2.20	1.78	2.00	1.55
1917(3)	68.00	50.00	3.25	2.73	3.00	2.42
1918(3)	84.00	64.00	3.80	3.15	3.50	2.60

In 1909 ten per cent of the male outdoor laborers on farms, hired at a monthly rate, were hired by the year(2).

Table XXI shows the ratio of agricultural workers to the improved area in farms(2), 1880, 1890, 1900, and 1910.

Table XXI.—Ratio of Agricultural Workers to Improved Area of Farms 1880, 1890, 1900 and 1910, Utah

Year	Average Improved Acres (Per Farm)	Persons 10 Years Old and Over, Gainfully Engaged in Agriculture (Per Farm)	Acres of Improved Land per Person 10 Years Old and Over, Gainfully Engaged in Agriculture
1880	44	1.6	28.6
1890	52	1.9	27.4
1900	53	1.6	35.3
1909(4)	63	1.7	37.4

It should be noted that there are on the average about the same number of men on each Hyde Park farm, as there are persons 10 years old and over gainfully engaged in agriculture in the State. There are about the same number of crop-acres to the man on the Hyde Park

(1)U. S. D. A., Bureau of Statistics, Misc. Series, Bul. No. 26, (1903), pp. 14-22.

(2)U. S. D. A., Bureau of Statistics, Misc. Series, Bul. No. 94, (Nov., 1912).

(3)U. S. D. A., Monthly Crop Report, (Dec., 1918).

(4)1910, U. S. Census.

farms as there are acres of improved land to each person 10 years old and over gainfully engaged in agriculture in the State.

Markets.—Markets for farm products affect the type of farming. Utah is not advantageously situated with respect to world markets. It is a great distance to the central farm produce markets of the United States. Comparison of Utah farm prices with the average farm prices of the United States(1) as a whole, for the three ten-year periods, 1880-1889, 1890-1899, and 1900-1909, shows that hay, wheat, barley, sugar-beets, and potatoes are lower in price in Utah; and that the prices of corn, oats, and rye are higher in Utah. The prices varied as follows: hay, $1.50 to $2.25 per ton less, wheat 2 to 6 cents per bushel less, barley 0 to 5 cents per bushel less, sugar-beets 5 cents to $2.50 per ton less, and potatoes 6 to 8 cents per bushel less, in Utah than in the United States as a whole; and corn 16 to 30 cents per bushel higher, oats 10 to 15 cents per bushel higher, and rye 0 to 2 cents per bushel higher in Utah than the average for the entire country (See Table XXIX in Appendix).

In general, the farm price is low for those products exported and high for those products imported; or, prices are low for products that are abundant and high for products that are scarce in relation to the local demand.

Where the market cannot be adapted to the type of farming otherwise best for an area, the type of farming must be adapted to the market.

Most of the very perishable products such as fruits and vegetables must be consumed near home and therefore have a limited market(2). Not only is our fruit-haul to market a long one but Utah peaches come on the market in competition with those of southern Michigan. The Michigan peaches have a decided advantage because they do not have to stand the costs of long transportation. In recent years the canning of many of these perishables has widened the market for them. This is especially true of tomatoes and peas. As a result of this wider market more tomatoes and peas are grown on Utah farms.

The milk market has been widened as a result of the development of condensed milk factories, creameries, and cheese factories. Because of this wider market more dairy cows are kept on farms. The surplus milk from Hyde Park farms is usually marketed at one of three places: (1) the branch factory of the Utah Condensed Milk Company, at Smithfield, (2) Borden's Condensed Milk Factory, at Logan, or (3) the Utah Agricultural College Creamery, at Logan.

Early each morning large milk wagons gather the milk cans from the homes about town. They deliver the milk to the factories and return with the cans, butter, and, if the milk is sent to a creamery, skim milk. These are left at the homes about 2:00 p. m. Some farmers have cream separators and usually send only cream to the creamery. After the cans are emptied at the factories they are washed and steamed before they are put back on the wagons. A regular rate for each hundred pounds or for each can of milk is charged for hauling. This cost is usually deducted from the farmers' milk checks at the factories and paid directly to the milk haulers.

In the past the meat animals have been shipped to the great meat-packing centers. At present most of the hogs and some sheep and cattle are marketed to advantage at Salt Lake City and Ogden, where packing plants are now in operation.

Hay, a very bulky product, has been shipped as far as Omaha and Kansas City, and often as far as Butte, Montana. There is not much

(1)U. S. D. A. Yearbook, 1917, Dec. 1, Farm Prices from 1880 to 1917. U. S. D. A. Bu. of Stat. Bul. No. 94, (Nov., 1912).

(2)Connor, L. G., U. S. D. A. Bul. No. 582 (1918), pp. 35-36.

shipped out of the State at present and because of the limited agricultural area of the State it is probable that hay as well as some other agricultural products will be imported in considerable quantities in the near future. Most of the Hyde Park hay is consumed at Hyde Park, Logan and Smithfield.

The sugar-beets are unloaded from the farmers' wagons onto cars or at the beet-dump at Hyde Park spur. From here they are shipped to the sugar factory at Logan, the erection of which made it possible for the farmers of this area to grow sugar-beets as a cash crop. The farmers are thus dependent upon the factory for a cash market, and in turn the factory is dependent upon the farmers for the beets. Potatoes are usually not grown in large commercial quantities at Hyde Park. Most of them are marketed either at Hyde Park or hauled to Logan or Smithfield.

Small-grains are easily shipped great distances to central markets and the Hyde Park grain is hauled to the Logan mills, to the Smithfield mills, or to the Hyde Park Spur and shipped to other markets. Each farmer's convenience and bargaining determine his methods of marketing.

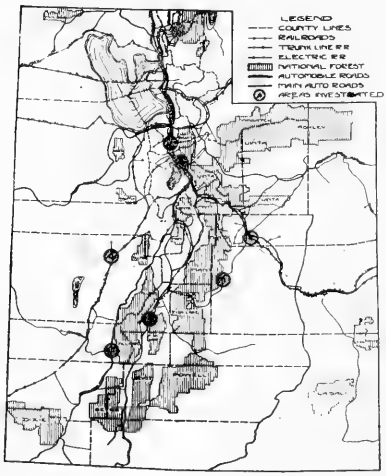

Fig. 20.—Railroads, Auto Roads, and National Forests, Utah. (after Clayson's Guide Map)

Wagon and Auto Roads and Railroads.—The State Road, which is the main auto road running north and south, passes thru the western part of Hyde Park Township and in general divides the meadow and pasture land on the west from the sugar-beet and potato land on the east. The center of the town of Hyde Park is situated about ½ mile east of this State Road. The Utah-Idaho Central Electric Railroad passes thru the center of town. The Hyde Park Spur is 1½ miles west from town on the Cache Valley Branch of the Oregon Short Line Railroad. Such markets as are available, are accessible to Hyde Park farmers by good wagon and auto roads and railroads. The fact that Hyde Park is on a branch line of the Oregon Short Line Railroad is a handicap in shipping to distant markets. (See Figure 20.)

Land Tenure.—By land tenure is meant the relationship of the farmers to the land which they operate. Land tenure is inseparably connected with type of farming(1). At Hyde Park most of the land which is now irrigated has been under cultivation for from 40 to 60 years. During the last 20 years the bench land east of town has been developed by dry-farming methods. The farm buildings are all in town where the farm families live. The farms in this area include, (1) dry-farm land on the bench, (2) irrigated land for cultivated crops west of the bench land, and (3) still farther west towards the center of the valley, meadow and pasture land. Most of the farms include some of each of these three distinct types of land. This condition makes possible a greater diversity of farm business on these farms and is one of the factors contributing to the prosperity of the area.

None of the 52 farms of which records were obtained in 1914 were

(1) Hibbard, B. H., "Tenancy in the United States", in Carver's "Readings in Rural Economics", pp. 498 to 546; and Holmes, G. K., Ibid pp. 487 to 497, "Tenancy in the United States".

tenant farms, but 23 of the 52 owners rented additional land, 18 paying cash rent for it, 3 renting on shares, and 2 paying cash for pasture and hay land and a share of the crop for the cultivated land. This is unusual because in Cache County generally share tenancy is most common. It must be remembered, however, that these farmers are not tenants but owners renting additional pieces of land. Since they have money to pay the cash for rent it is to their advantage to do so, for thus they get all of the produce. There were 184.5 acres rented for cash, for which $1,685 was paid, or an average of $9.13 per acre. Pasture rent was about $2 to $3 per acre and cultivated crop land ranged from $7 to $21 per acre, the latter being paid for an unusually good piece of sugar-beet land. Twenty-one acres was the largest piece of this irrigated land rented for cash. One piece of 360 acres of dry-farm land was rented for $860 cash. Two other pieces of dry-farm land amounting to 258 acres were rented on shares, the tenants getting six-tenths of the wheat crop. One piece of 128 acres of irrigated land was rented on shares. The tenant received one-half the hay and oats raised on the piece. Two other pieces were rented and the tenant received a trifle more than half the wheat in the one case and five-ninths of the alfalfa in the other. One young man had the use of 5 acres of his father's land and had all the crop. Another farmer, in addition to his own land, managed the family estate. He kept his aged mother and father and had all that he made from the estate. (See Tables III in Text and XXX in Appendix).

In 1914 the personal and property taxes amount to about 0.6 per cent and the water taxes amounted to about 0.2 per cent of the total farm capital investment. As a general rule the landlord or owner of the rented land or water pays the taxes. Land and water may be rented separately or together. (See Table XXX in Appendix).

On the average the 52 Hyde Park farmers have been owners of farms 20.7 years, and owners of the farms which they now operate 18.5 years. Those who have rented land at all have been tenants on the average for 4.7 years, and on the average they have been tenants of the land which they now rent in addition to their own land for 3.6 years. The land is rented for the purpose of increasing the size of the business and no doubt here as elsewhere is an intermediate step in the process of becoming owners of the land operated.

The small percentage of tenancy here is due to a number of circumstances and conditions. The country is new and it has been easy to become a farm owner without tenancy, by (1) homesteading or (2) purchasing. The farms are comparatively small and therefore the total capital necessary to purchase a farm is not so great as to make purchasing prohibitive to those who are moderately well-to-do. The type of farming followed is one that is conducive to ownership and compared with the farming of the North Central States is less attractive to tenants and less adaptable to tenant farming. Land has increased enormously in value. This has been a great incentive to farmers to own their own farms. These facts largely account for the present low percentage of tenant farmers at Hyde Park as well as in Cache County and the State.

In 1910(1) the approximate total land area of Cache County was 744,960 acres, 294,160 acres in farms, 181,348 acres improved land in farms, 5,779 acres of woodland in farms, 107,033 acres of other unimproved land in farms, and 450,800 acres of land not in farms. Thus 40 per cent of the land was in farms in 1910 and 62 per cent of this farm land was improved. There were 1,907 farms in the county with an average of 154.3 acres per farm, of which 95.1 acres were improved.

(1)1910 U. S. Census.

As late as July 1, 1918, there were still 239,918 acres of land in the county unappropriated and unreserved, of which 12,381 acres were surveyed and 227,537 acres were unsurveyed(1).

Of the 52,597,760 acres of land in Utah(2), 31,475,919 acres, or 60 per cent, were unappropriated and unreserved on July 1, 1918(1). This land is described as "generally arid, agricultural, mineral, grazing, and mountainous." Of this amount, 14,010,343 acres were surveyed and 17,465,576 acres were unsurveyed.

In the 9 years from 1909 to July 1, 1918, there were in Utah 5,175,143 acres of public land entered for settlement. This is an average of 575,016 acres each year. In 1910(2) there were only 3,397,699 acres in farms in the State and 1,368,211 acres of farm land improved. In the 9 years, 1910 to July 1, 1918(1) there was 69 per cent more land entered for settlement than there was land in farms, and more than four times as many acres as there was improved land in farms, April 15, 1910.

Of the 284,028,210 acres of unappropriated and unreserved lands of the 11 far Western Range States, July 1, 1914, it is estimated that only 12 per cent, or 34,080,000 acres were suitable for agricultural settlement under the then existing laws(3). Since July 1, 1914, three amendments to the Desert Land Laws(4) have been passed and the Stock-Raising Homesteads-Act of December 29, 1916(5) has become operative. Undoubtedly these laws have made it practicable to settle more of this land than it was wise to settle before their enactment.

Table XXII shows the number of farms, the average size of farm, and the relationship of the farmers to the land which they operate Cache County, Utah, 1880, 1890, 1900, and 1910.

Table XXII.—Tenure of Farms, Cache County, Utah, 1880, 1890, 1900, and 1910(2)

Year	Number of Farms	Average Size (Acres)	Number Farms Operated by				Percentage of Farms Operated by	
			Owners	Part Owners	Owners and Tenants	Managers	Owners	Tenants
1880 ..	998	85	943	.....	....	....	94.5	5.5
1890 ..	1,065	94	979	.....	....	....	91.9	8.1
1900 ..	1,795	176.4	1,446	236	6	16	80.6	5.1
1910 ..	1,907	154.3	1,756	.....	....	12	92.1	7.3

Over 92 per cent of the farms were operated by the owners in 1910 and only 7.3 per cent by tenants. Tenancy does not seem to be increasing in the County. The figures show a smaller percentage of the farms operated by owners in 1910 than in 1880, but a greater percentage of them operated by tenants in 1890 than in 1910. Share tenancy always has been and is now the most common form. (See Table XXIII.)

(1)U. S. D. I., G. L. O., Cir. No. 608, (July, 1918).
(2)1910 U. S. Census.
(3)U. S. D. A., Off. of Sec. Rpt. No. 110, Part II, (July 1, 1916), pp. 17-18.
(4)U. S. D. I., G. L. O. Cir. No. 474, (May 18, 1916).
(5)U. S. D. I., G. L. O. Cir. No. 523, (Jan. 27, 1917).

Table XXIII.—Number and Kinds of Tenants, Cache County, Utah, 1880, 1890, 1900, and 1910(1)

Year	Number and Kinds of Tenants				
	Total	Share	Cash	Share and Cash	Not Specified
1880	55	33	22	....	....
1890	86	55	31	....	....
1900	91	76	15	....	....
1910	139	59	35	11	34

The explanation of conditions as found in Table XXIII is the same as that given for the conditions at Hyde Park.

Table XXIV shows the total area, area in farms, and the area of farm land improved in the State, and in each county, arranged according to the acres of improved farm land, 1909. Cache County had the greatest and Grand County the smallest area improved.

Table XXIV.—Total Land Area, Land in Farms, and Improved Land in Farms, by Counties, Utah, 1909(1)

	Acres		
	Improved land in farms	All land in farms	Total area
State	1,368,211	3,397,699	52,597,760
County			
1. Cache	181,348	294,160	744,960
2. Boxelder	142,922	343,185	3,484,160
3. Utah	124,496	234,717	1,301,760
4. Salt Lake	121,221	169,262	483,840
5. Sanpete	105,807	261,771	1,000,960
6. Rich	81,779	149,509	657,280
7. Weber	59,781	148,359	346,240
8. Sevier	56,338	122,332	1,265,920
9. Davis	55,376	127,257	176,000
10. Millard	54,540	166,627	4,226,560
11. Juab	53,466	108,564	2,182,400
12. Wasatch	43,220	154,083	2,786,560
13. Emery	39,386	96,708	2,849,920
14. Uinta	35,748	82,072	3,350,400
15. Tooele	34,239	88,332	4,383,360
16. Summit	32,645	261,056	1,191,680
17. Beaver	19,354	35,986	1,702,400
18. Garfield	19,109	59,973	3,349,760
19. Iron	17,934	88,027	2,083,840
20. Piute	16,964	25,869	488,320
21. Carbon	13,824	56,653	951,680
22. Washington	13,632	50,273	1,577,600
23. Morgan	11,691	95,648	400,640
24. Wayne	11,538	31,617	1,584,000
25. Kane	8,685	24,773	2,697,600
26. San Juan	6,698	48,797	4,967,040
27. Grand	6,470	62,089	2,362,880

(1)1910 U. S. Census.

Table XXV shows the percentage of all farms operated by the owners, part owners, and tenants in Utah, 1880, 1890, 1900, and 1910 as given by the U. S. Census Reports.

Table XXV.—Percentage of Tenancy, Utah, 1880-1910

Year	Per cent of all Farms Operated by		
	Managers	Owners and Part Owners	Tenants
1880	....	95.4	4.6
1890	....	94.8	5.2
1900	1.6	89.6	8.8
1910	.9	91.2	7.9

The explanation of the tenancy conditions of the State as shown in Table XXV is the same as that of the conditions at Hyde Park. (See Tables XXXI to XXXVI in Appendix).

Land Values.—Land values are largely determined by type of farming. The agricultural value of a piece of land is the capitalized agricultural income of that land with all future increases discounted to date; and the income of the land is obviously a result of the type of farming practised(1).

The individual farmer must follow a type of farming that is profitable on land of a given value. Land which can be rented profitably for $20 an acre for producing sugar-beets will not be rented for $3 an acre and used for pasture, except in unusual and rare cases. The value of the land will be based upon the $20 and not the $3. And as long as there are men who want the land for sugar-beets and can afford to pay $20 an acre for it, other men as a rule will not be so unwise, for any length of time, as to pay $20 for such land and use it as pasture when such use will not be profitable for any rent above $3.

The factors affecting land values are too numerous to mention here. Only a general analysis is given. Before 1847 land in Utah had little

Table XXVI.—Total Value of Land and Buildings, and Value of Land and Buildings per Farm and per Acre, 52 Farms, Hyde Park, Cache County, Utah, 1914

Total Acres in all 52 Farms	5,434
Average number acres per farm	105
Total Value of Land and Buildings (2)	$577,815
Value of Land and Buildings per Farm	11,112
Value of Land and Buildings per Acre	106
Total Value of Land	478,500
Value of Land per Farm	9,202
Value of Land per Acre	88
Total Value of Buildings	99,315
Value of all Buildings per Farm (in Town)	1,910
Value of all Buildings per Acre	18
Value of Dwellings per Farm (2)	1,284
Value of other Buildings per Farm	626

(1) Taylor, H. C.—Agricultural Economics, (1914), ch. 10, pp. 185—197, Macmillan Co., N. Y.

(2) Reports on the value of dwellings were obtained from 50 farms only. The average value of dwellings for the 50 farms reporting was $1,335.

or no agricultural value. Such as it might have had was based upon its prospective future use. As the State became populated, land came to have a value based upon its productivity. This value increased as population became more dense and the land more developed and improved.

Comparison of Hyde Park values as given in Table XXVI with those for Cache County and the State, given in Tables XXVIII, XXIX and XXX shows this area to be much better than the average. It has been settled longer and is more developed than many sections of the state.

It is impossible to show from the records obtained the changes in land values at Hyde Park. The 1915 and 1916 farm values were raised or lowered by the farmers as determined more by the accuracy of their 1914 estimate than by the actual changes in the market value of the land.

Table XXVII was made in order to determine the correlation between distance to market and the value of farm land per acre in each of the 7 districts in which farm business records were taken in 1914.

Table XXVII.—Distance from Market and Land Values per Acre in 7 Areas, Utah, 1914

	Distance from Market in Miles							
	On Place	0 to .9	1 to 1.9	2 to 2.9	3 to 3.9	4 to 4.9	5 to 5.9	6 & Over	Average
Value of land per Acre at Beaver	$41	$ 58	$ 45	$ 66	$ 37	$ 76	$	$104	$ ....
Value of land per Acre at Hyde Park	65	150	32	92	....	168	50	220	88.
Value of land per Acre at Wellington	....	47	37	55	40	....	....	....	....
Value of land per Acre at Ferron	32	37	62	30	....	....	....	30	....
Value of land per Acre at Hinckley	35	64	63	....	85	74	44	41	....
Value of land per Acre at Sandy	76	140	197	195	111	88	108	126	....
Value of land per Acre at Monroe	....	95	111	135	85	89	83	74	....

There seems to be no correlation between distance to market and value of land per acre as given in Table XXVII. The difficulty is that other factors are more important, and therefore the correlation which undoubtedly exists is not visible. Those farms nearest to market have an advantage in marketing. Land values are certain to be high there because of this advantage. The average value of land per acre at Hyde Park in 1914 was $88. This is $50 higher than the average value for Cache County and $59 higher than the average value of land in the State in 1910. At Hyde Park farm products are readily marketed as explained in a previous paragraph. Consequently better soil may offset easily the advantage of nearness to market. The fact that there are too few farms in the groups makes Table XXVII of little value except in indicating the method of observation.

Table XXVIII shows the percentage of land in farms and farm land improved and land value per acre, by counties, for Utah on April 15, 1910. The counties are arranged according to the percentage of farm land improved.

Table XXVIII.—Percentage of Land in Farms and Farm Land Improved and Land Value per Acre, by Counties, Utah, 1910(1)

	Percentage of		Land Value per Acre
	Farm Land Improved	Land Area in Farms	
State	40.3	6.5	$29.28
County			
1. Salt Lake	71.6	35.0	78.34
2. Piute	65.6	5.3	23.51
3. Cache	61.6	39.5	37.85
4. Rich	54.7	22.7	9.32
5. Utah	53.0	18.0	58.27
6. Juab	49.3	5.0	18.95
7. Sevier	46.1	9.7	32.67
8. Uinta	43.6	2.4	25.89
9. Davis	43.5	72.3	61.41
10. Beaver	42.1	2.7	25.33
11. Boxelder	41.6	9.8	28.25
12. Emery	40.7	3.4	26.75
13. Sanpete	40.4	26.2	19.91
14. Weber	40.3	42.8	50.55
15. Tooele	38.8	2.0	24.80
16. Wayne	36.5	2.0	12.91
17. Kane	35.1	0.9	11.45
18. Millard	32.7	3.9	18.51
19. Garfield	31.9	1.8	11.87
20. Wasatch	28.1	5.5	17.86
21. Washington	27.1	3.2	18.39
22. Carbon	24.4	6.0	15.05
23. Iron	20.4	4.2	13.37
24. San Juan	13.7	1.0	10.99
25. Summit	12.5	21.9	7.71
26. Morgan	12.2	23.9	12.32
27. Grand	10.4	2.6	18.42

In constructing Table XXIX the 27 counties of the State were divided in four groups according to the percentage of farm land improved. This table shows that there is a correlation as expected between the use

Table XXIX.—Relation of Improved Farm Land to Value of All Farm Land Per Acre, Utah, 1910(1)

Group(2)	No. Counties	Percentage of Farm Land Improved (Average)	Percentage of Land Area in Farms (Average)	Value of all Land Per Acre (Average)
1	7	57.4	19.3	$36.99
2	7	41.7	22.8	34.01
3	7	31.5	2.8	16.54
4	6	15.6	9.9	12.98

(1) Adapted from 1910 U. S. Census, Supplement for Utah, Table 1, pp. 612-614.

(2) Groups are based upon percentage of farm land improved as shown in Table 25. Group 1 has the 7 counties with the greatest percentage and Group 4 the least percentage of farm land improved.

of land and its value. In general, the value of farm land is highest in those counties where the population is most dense and the greatest percentage of farm land is improved. (See Figure 19).

Table XXX shows the average values per acre of farm land, buildings, machinery, and livestock, by counties, Utah, April 15, 1910(1).

This table is useful in connection with this study in comparing the counties with each other and the average of the State.

Table XXI shows the average value of land and buildings per acre by counties, Utah, Census Years, 1860 to 1910.

Table XXX.—Average Values per Acre of Farm Land, Buildings, Machinery, and Livestock, by Counties, Utah(1), 1909

	Land	Buildings	Implements and Machinery	Domestic Animals, Poultry and Bees
The State	$29.28	$5.32	$1.32	$8.46
County				
1. Salt Lake	78.34	15.13	1.92	9.97
2. Davis	61.41	13.24	1.72	6.62
3. Utah	58.27	9.72	2.33	10.17
4. Weber	50.55	10.71	1.89	6.72
5. Cache	37.85	6.83	1.37	6.82
6. Sevier	32.67	4.28	1.86	10.82
7. Boxelder	28.25	4.23	1.28	6.59
8. Emery	26.75	4.05	1.66	7.44
9. Uinta	25.89	4.97	2.06	11.12
10. Beaver	25.33	4.09	1.72	11.33
11. Tooele	24.80	6.32	1.05	6.81
12. Piute	23.51	4.41	1.87	10.32
13. Sanpete	19.91	3.81	1.11	8.84
14. Juab	18.95	1.79	1.16	7.50
15. Millard	18.51	3.24	1.15	5.69
16. Grand	18.42	2.27	.96	13.97
17. Washington	18.39	4.74	1.78	15.95
18. Wasatch	17.86	3.19	1.08	9.12
19. Carbon	15.05	2.11	.91	7.65
20. Iron	13.37	.76	.89	13.79
21. Wayne	12.91	4.02	1.32	16.61
22. Morgan	12.32	2.91	.62	3.79
23. Garfield	11.87	2.88	.90	17.28
24. Kane	11.45	5.45	1.31	29.34
25. San Juan	10.99	2.47	.78	18.67
26. Rich	9.32	1.47	.60	6.67
27. Summit	7.71	1.74	.40	3.42

In general the value of land and buildings per acre has increased each successive census period. The value in 1900 shows a decrease because much grazing land of low value was included as farm land in the census of 1900 and this lowered greatly the average value of farm land per acre.

As population increases or the relative prices of farm products rise or interest rates become lower the land is more thoroughly and intensively utilized and land values become greater. Land values also rise when the relative value of the dollar decreases.

Water Tenure.—At Hyde Park about two-thirds of the crop land is irrigated and the other one-third is dry-farm land. Most of the Hyde

(1)1910 U. S. Census

Park land that can be irrigated is now irrigated. Either the water supply or the location of the land limits extension of the area. Above the Logan, Hyde Park, and Smithfield canal there is some bench land for which there is no water. This is now dry-farmed to good advantage.

Three canal systems from Logan River supply the irrigation water for Hyde Park: (1) Logan and Hyde Park Canal, (2) Logan and Richmond Canal, and (3) the Logan, Hyde Park and Smithfield Canal. (See Fig. 21.

Table XXXI.—Average Value of Land and Buildings per Acre, by Counties, Utah, Census Years

	1910	1900	1890	1880	1870	1860
State	$34.60	$12.33	$21.46	$21.38	$15.49	$14.82
Counties						
Beaver	29.42	20.14	14.10	22.98	10.17	7.54
Boxelder	32.48	5.52	5.53	17.90	11.80	17.96
Cache	44.68	15.61	20.29	17.52	9.75	15.99
Carbon	17.16	8.41	.....	.....	.....	.....
Davis	74.65	16.71	35.44	20.20	40.45	28.02
Emery	30.80	14.36	12.83	1.50	.....	.....
Garfield	14.75	13.09	15.17	.....	.....	.....
Grand	20.69	20.68	14.41	.....	.....	.....
Iron	14.13	13.95	14.45	24.28	8.08	6.33
Juab	20.74	12.06	15.17	37.95	10.15	5.77
Kane	16.90	14.95	19.57	28.33	30.66	.....
Millard	21.75	15.81	8.12	15.66	7.94	.....
Morgan	15.23	4.57	26.11	20.51	20.39	.....
Piute	27.92	11.22	10.55	2.76	.....	.....
Rich	10.79	6.37	10.26	8.37	11.33	.....
Salt Lake	93.47	30.80	82.11	37.66	35.24	17.01
San Juan	13.46	5.64	13.48	3.94	.....	.....
Sanpete	23.72	20.56	21.42	21.66	15.88	8.37
Sevier	36.95	22.03	15.49	9.42	8.42	.....
Summit	9.45	5.06	20.36	11.02	4.28	.....
Tooele	31.12	10.67	23.02	24.19	42.35	20.28
Uinta	30.86	3.38	17.13	2.33	.....	.....
Utah	67.99	29.79	41.83	24.81	12.85	8.28
Wasatch	21.05	9.35	18.66	15.83	4.74	.....
Washington	23.13	34.36	39.32	44.34	30.71	28.52
Wayne	16.93	9.56	.....	.....	.....	.....
Weber	61.26	21.89	6.18	2.38	15.29	17.94

Irrigation from the Logan River began in 1860. Soon afterward the Logan and Hyde Park canal was begun. In 1864 the Logan and Richmond Canal was begun. This latter canal now supplies water for land above or east of the Logan and Hyde Park Canal. The Logan and Richmond Canal was not completed until 1877 (1). Twice since then it has been enlarged. The Logan, Hyde Park, and Smithfield Canal made its first appropriation of water in 1882 (2). The first 7,000 feet of this canal is constructed on a steep mountain side necessitating considerable rock work, and its course is very much higher in elevation than either of the other canals. It shall therefore be referred to hereafter as the High Line Canal in contrast with the Upper and Lower Canals.

(1) Swenson, G. L.—U. S. D. A. Bul. No. 86 (1900), pp. 197-218.
(2) Swenson, G. L.—U. S. D. A. Bul. No. 104 (1902), pp. 179-194.

The Logan and Richmond Canal, or Upper Canal, supplies sufficient water on the average to irrigate about 3,186 acres and the Logan, Hyde Park, and Smithfield Canal, or High Line Canal, about 3,200 acres. The Upper Canal system is owned and managed by the farmers organized as an irrigation company under the law passed in 1865, and the High Line Canal system is owned and operated by the farmers organized as a stock company.

In both canals water-rights were obtained in payment for services in constructing them or bought from the original owners. In the Upper Canal a water-right entitles one to sufficient water to irrigate a certain number of acres, a very variable and uncertain quantity; but in the High Line Canal a water-right entitles one to only his proportion of the available irrigation water, a more variable and uncertain amount; and the division is made on the basis of shares of stock held in the company. In neither case does the right specify an exact quantity of water. This lack of specification has advantages and disadvantages. However, it is impossible to discuss them here.

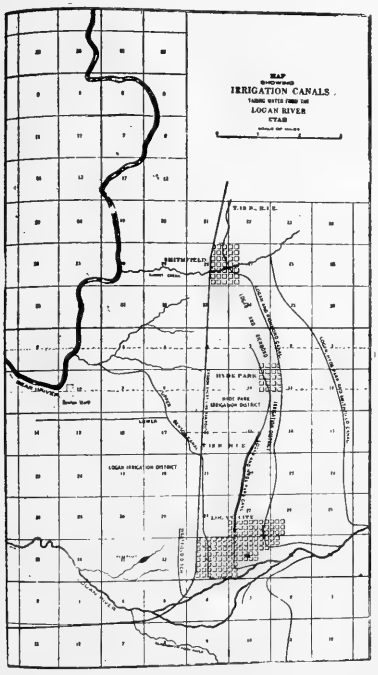

Fig. 21.—Three Canals that Supply Irrigation Water for Hyde Park Farms, Cache County, Utah. (after G. L. Swenson)

A claim to sufficient water to irrigate one acre cost the original owners of the Upper Canal $18 to $20 and about 50 cents annually per acre irrigated for operation and maintenance of the canal system. Only one-third of the 50 cents per acre charge is required in cash. The other two-thirds may be paid in labor. The original shares in the High Line Canal cost $5 each and the annual maintenance and operation of the canal system cost about 50 cents per share.

The best way to express the duty of water is in inches or cubic feet per second when the water is not stored, but when the water is stored it is best expressed in acre-feet. It is better to express it in acre-feet per acre and not in a fraction of an acre per acre-foot. When a stream is discharging one cubic foot of water every second of time there is a second-foot flow. A second-foot stream discharges approximately one acre-inch per hour, one acre-foot in twelve hours, two acre-feet in twenty-four hours (one day), and two hundred forty acre-feet in the four months, May 1 to August 31, inclusive(1).

The duty of water under the High Line Canal was about sixty acres per cubic foot per second in 1900, and the duty under the Upper Canal was about sixty-two acres per cubic foot per second including loss from seepage and evaporation from the canal and forty-seven acres not including this loss. The duty may be greatly increased by the time

(1) Winsor, L. M.—Utah Exp. Sta. Cir. No. 6 (1912); and Israelsen, O. W.—Utah Exp. Sta. Cir. No. 36 (1919).

method of distribution under which each acre-right entitles the person to the use of an "irrigating stream" for a specified number of hours.

Water masters are elected by the owners of each system. These water masters have complete supervision over the water distribution. There are but few gauges or measuring devices, and headagate boxes are of variable sizes. Tho "irrigating streams" are supposed to be equal, they are not. The equivalent of an "irrigating stream," as measured, ranged from 0.85 to 3.12 cubic feet per second(1). The splendid success of these canals has been due to (1) the general spirit of cooperation among the water users, and (2) the type of men who have managed the distribution of the water.

A good irrigating stream for the average man under average conditions is from 2 to 5 second-feet(2). Three to five acre-inches is enough for a good irrigation. Two and one-half acre-feet is the maximum needed in Utah, in addition to the precipitation to produce a crop, if it is applied at the proper season between May 1 and August 31, inclusive. One second-foot will irrigate 70 to 160 acres in the four months of the irrigating season.

In Cache County, as in all parts of the State, water tenure, water-rights, and the operation and management of the canal systems are of prime importance. In 1910(3) there were 1,907 farms in Cache County, 1,501(4) or 79 per cent of which were irrigated. The approximate land area of the county was 744,960 acres. There were 294,160 acres in farms, 181,348 acres—not including wild grass land—improved, and 77,330 acres—including wild grass land—irrigated. The land irrigated was 10.4 per cent of the total land area, 26.3 per cent of the land in farms, and 42.6 per cent of the improved land in farms. In 1910 the irrigation enterprises were capable of irrigating only 82,503 acres, but 119,304 acres were included in the projects. There were 62,230 acres irrigated by cooperative enterprises(5). These same enterprises were capable of irrigating 63,767 acres and included 97,521 acres. The remainder of the land was irrigated under the following projects: (1) irrigation districts(6), 8,455 acres; (2) individual and partnership enterprises(7), 5,623 acres; and (3) commercial enterprises(8), 1,022

(1) Swenson, G. L.—U. S. D. A. Bul. No. 104 (1902), pp. 179-218.

(2) Winsor, L. M.—Utah Exp. Sta. Cir. No. 6 (1912).

(3) U. S. Census (1910)

(4) Ibid.—"The number of 'farms irrigated' is the number of farms on which irrigation is practised, and is equivalent to the term 'number of irrigators' which was used in previous census reports."

(5) Ibid.—"Cooperative enterprises are those which are controlled by the water users under some organized form of cooperation. The most common form of organization is the stock company, the stock of which is owned by the water users."

(6) U. S. Census (1910)—"Irrigation districts are public corporations that operate under state laws providing for their organization and management, and empowering them to issue bonds and levy and collect taxes with the object of obtaining funds for the purchase or construction, and for the operation and maintenance of irrigation works."

(7) Ibid.—"Individual partnership enterprises belong to individual farmers or to neighboring farmers, who control them without formal organization. It is not always possible to distinguish between partnership and cooperative enterprises, but as the difference is slight this is unimportant."

(8) Ibid.—"Commercial enterprises supply water for compensation to parties who own no interest in the works. Persons obtaining water from such enterprises are usually required to pay for the right to receive water, and to pay, in addition, annual charges based in some instances on the acreage irrigated and in others on the quantity of water received."

acres. The source of the water supply for irrigation was as follows: (1) streams, by gravity, 73,369 acres; (2) springs, 3,916 acres; and (3) flowing wells, 45 acres. There were 137 independent irrigation enterprises having 139 main ditches, with a combined length of 324 miles and a combined capacity of 1,393 cubic feet per second. There were 153 laterals with a combined length of 142 miles. Other sources of water are: one reservoir, filled by collecting storm water or by a water course that is ordinarily dry, of 1,566 acre-feet capacity; and thirty-three flowing-wells of 734 gallons per minute capacity. The cost of all irrigation enterprises reporting costs, as reported by the 1910 census, up to July 1, 1910, was $304,285. The average cost of construction per acre that enterprises were capable of irrigating in 1910 was $3.69. The estimated final cost of existing enterprises was $304,285, or an average of $2.55 per acre included in the projects. The cost of operation and maintenance was reported for 63,507 acres and amounted to $26,974, or an average of 42 cents per acre.

Water was formerly personal property in Utah(1) and rights were sold, exchanged, and leased with little regard for formalities—and often without making any official record of the transactions. When a farmer found that his water-right furnished him more water than he needed, he sold a part of it outright, or rented a part of it by the year to some neighbor, or he bought another piece of land and transferred a part of his water-right to it. A ditch company could rent or sell a part of its rights to some other ditch company.

And even now not all the irrigators of Utah have definite, undisputed, legally defined titles to water. Often the seller does not know what he is selling, nor the buyer what he is buying. The water transferred is supposed to irrigate a certain number of acres. It may irrigate more or less, depending upon the available supply in the streams and upon how the water master divides it.

Only recently has any attempt been made to measure out any certain quantity of water. The water of but few of the streams is divided accurately. The records of water-rights are now entered in the office of the State Engineer who also issues all permits to appropriate water. The rights of appropriations now issued by the State Engineer state specifically in feet and inches the amount of water included, but it is a difficult task to determine how much water to allow permits for in the various streams, because the volume of water in the streams varies greatly from year to year and from season to season. However, investigations and experience have given a body of quite accurate information for the most important streams of the State.

The foregoing discussion shows clearly how water tenure affects the type of irrigation farming. Water is almost as important in determining type of farming as land. While perhaps not more than 10 per cent of the land in Utah will ever be cultivated, yet if even this area is farmed profitably it will be possible only by irrigation.

Irrigation Practice.—On the farm lands at Hyde Park the custom is to use the water whenever and wherever it may be needed up to the limit of the supply. The average irrigating season is 110 to 120 days in May, June, July, August, and September. There are two methods of applying the water: (1) flooding the whole surface, used in irrigating (a) wheat, (b) oats, (c) alfalfa, (d) hay, (e) corn, and (f) orchards; and (2) the furrow method which is used in irrigating (a) sugar-beets, (b potatoes, (c) gardens, (d) orchards, and (e) corn.

Wheat, oats, corn, and hay are usually irrigated twice; sugar-beets, potatoes, alfalfa, and the other crops three or more times. The depth of

(1)Gemmell, R. C.—U. S. D. A. Bul. No. 104 (1902), pp. 159-163.

irrigation water used varies greatly with crop and soil. In 1899 the average was about 3.59 feet(1). The total water received by the land was 3.59 feet by irrigation and 0.16 feet by rainfall, a total of 3.75 feet. The average depth applied at each irrigation in 1899 was 1.2 feet. In 1899 the greatest demand for water was for wheat and alfalfa and therefore came first in July and second in June. The demand in August and September was due to the late irrigations of alfalfa. At present little wheat is raised at Hyde Park by irrigation. The irrigation of alfalfa is about the same now as twenty years ago, but sugar-beets have taken the place of wheat as a cash crop on the irrigated land. The heavy irrigating seasons are now, as they were in 1899, in July and June. Table XXXII shows the crops grown, the period of irrigation, the number of irrigations, and the days between irrigations, Hyde Park, Cache County, Utah, 1900.

Table XXXII.—Crops Grown, Period of Irrigation, Number of Irrigations, Days Between Irrigations, Logan and Richmond Canal, 1900(1)

Crop Grown	Period of Irrigation	No. of Irrigations	Days Between Irrigations
Wheat	June 1 to August 15	2	21
Oats	June 15 to August 20	2	25
Alfalfa	June 6 to September 10	3 to 5	21
Potatoes	July 10 to August 29	4 to 6	20
Sugar-beets	June 15 to September 20	5 to 7	15
Gardens	June 1 to September 15	7 to 15	7
Orchards	June 1 to September 15	7 to 15	7

The wheat and oats were irrigated twice. Twice as many irrigations were necessary for alfalfa as for the small-grains and about twice the amount of water was also applied, 2.90 feet as compared to 1.25 feet on oats where no waste occurs(1).

Quantity of Irrigation Water to Use(2).—Wheat requires relatively little water. On deep, well-tilled soils 7½ inches of water in two irrigations should be sufficient; on shallow, gravelly soils as high as 18 inches may be used in 4 or 5 irrigations. An average of one acre-foot should be ample for the production of wheat on fertile, well-tilled soils. Oats should not receive less water than wheat; barley about the same amount as wheat; but rye may be grown with less water than the other small-grains. Corn should seldom receive more than from 12 to 18 inches of water.

Alfalfa can make use of more water than the grains and should receive from 12 to 24 inches of water according to the age of the crop and the depth of the soil. Ordinarily, 18 inches should be enough. The other hay-making crops like timothy and orchard grass need even less water than a crop of wheat. They are cut only once, while alfalfa is cut three times or more. Clover requires probably from 12 to 15 inches of water. Pastures and meadows should receive according to location from 12 to 24 inches of water.

Under present practice sugar-beets receive from 15 to 24 inches of water, but the tendency is for somewhat less to be used. Carrots and other root crops should receive about the same. The more seed is planted the more water is required. Potatoes need a good supply of water in

(1)Swenson, G. L.—U. S. D. A. Bul. No. 104 (1902), pp. 179-218.

(2)Widtsoe, J. A., Stewart, Geo.—"Western Agriculture" (1918) p. 138. Web. Pub. Co., St. Paul, Minn.

the soil at planting time. The total quantity should be about the same as that for sugar-beets.

As a rule cultivated crops on irrigated land require less water than uncultivated crops. Alfalfa requires more than potatoes and oats more than corn. It has been aptly said that "the limit of profitable economy (in irrigating) is to use the least quantity of water necessary to secure the best yield"(1). This is true if by "best yield" we mean the most profitable yield. The most profitable yield is not necessarily the highest yield.

It is fairly safe to say that all ordinary crops, including trees and shrubs, should receive from 12 to 24 inches of water. This amount is considerably less than is now applied to crops. As better cultural methods are employed the duty of water becomes higher, that is, less is used per acre.

When to Irrigate.—Investigations at Greenville, the township adjoining Hyde Park on the South, with conditions very similar in most respects to the Hyde Park area, show that about 20 inches of water may be recommended for use for the growing of corn for grain(2) and about 30 inches for growing corn stover(3). With sugar-beets, 1 inch of water weekly gives higher yields than more than this amount. If only one irrigation is given the best time to apply it is when the beets are about 2 inches in diameter as this results in a higher percentage of sugar in the beet than when watered at any other time(4).

The highest yield of potatoes is produced where small regular irrigations are given. One inch weekly or 12.8 inches during the season gives a higher yield than any other treatment(5). This involves a labor problem which complicates the irrigation practice. When as much as 96 inches of water are applied the yield is less than where no water is applied. Where but one irrigation is applied, it gives best results if applied when the potatoes are in full bloom. The second best stage is just as tubers begin to form. Discontinuing irrigation during the rapid growing season, after it is once begun, decreases the yield. Excessive moisture, or that applied late in the life of the plant, increases the relative production of vines. The relative number of tubers per hill is increased by early irrigation, while the relative size of the tubers is influenced more by late water. It is very important to have an even supply of moisture during the middle portion of the life of the potato after the tubers begin to form, and before they begin to ripen.

Irrigation experiments with oats show that plats receiving 5 inches of water each week for 6 weeks (total 30 inches) gave the highest yield, 79.9 bushels. The next highest yield was 79 bushels an acre and was produced with 15 acre-inches of water (3 five-inch irrigations)(6).

If water was the only limiting factor here, it is evident that it would be unwise to apply the additional 15 inches to obtain a yield of only one additional bushel, because the same 15 inches if applied to another acre of land might produce the same yield as the first 15 inches or 79 bushels. Land as land is not a limiting factor here, but land of a particular farm so situated as to be readily irrigated and thus to utilize to best advantage the 15 inches of water is a limiting factor. Where the location of land

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(1) Meade, Elwood—"Irrigation Institutions" (1910), pp. 116-117. Macmillian Co., New York.

(2) Harris, F. S., Utah Agr. Exp. Sta. Bul. No. 133, (May, 1914),

(3) Harris, F. S., and Pittman, D. W., Utah Agr. Exp. Sta. Bul. No. 154, (April, 1917), p. 21.

(4) Harris, F. S., Utah Agr. Exp. Sta. Bul. No. 156, (June, 1917), p. 22.

(5) Harris, F. S., Utah Agr. Exp. Sta. Bul. No. 157, (June, 1917), p. 17.

(6) Harris, F. S., and Pittman, D. W., Utah Agr. Exp. Sta. Bul. No. 167, (March, 1919), p. 17.

limits its use and labor is not a preventing factor, it may be profitable to an individual farmer to apply the additional 15 inches of water in order to obtain the additional yield of one bushel of oats per acre. While this condition may make this practice profitable to an individual farmer, it certainly would be uneconomical from the standpoint of society as a whole, because some farmer in any irrigated area can use 15 inches of water more economically than producing just one bushel of oats.

It is apparent then that three five inch irrigations, (1) at the five-leaf stage, (2) at the early-boot stage, and (3) in the bloom stage, with an average yield per acre of 79 bushels give the most satisfactory results generally. Where only one irrigation is given the best time is at the five-leaf stage. Where two irrigations are given, (1) the five-leaf, and (2) the boot stages are best.

In the case of alfalfa the first irrigation should occur just before the time of bud formation, and another just before or after each cutting. Four or five inches of water form a fairly large single application. Usually a smaller quantity is sufficient to maintain the crop in good condition(1).

Farm Credit.—That the farmers' ability to get money may affect the type of farming practised in a region has been well demonstrated in the tenant system of single-crop cotton-farming in the Southern States.

Table XXXIII.—Farm Mortgages, Hyde Park, Cache County, Utah, 1914

Number of farms reporting	52	
Number of farms mortgaged	18	
Amount of mortgaged debt (average)	$1,151	
Value of land and buildings per farm mortgage (average)	9,559	
Ratio of mortgage debt to value of land and buildings	12	per cent
Number of farms on which rate of interest paid was 6 per cent	1	
Number of farms on which rate of interest paid was 8 per cent	14	
Number of farms on which rate of interest paid was 8½ per cent	1	
Number of farms on which rate of interest paid was 9 per cent	2	
Average rate of interest paid by 18 farmers	8.03	per cent

Again many farmers of the Intermountain States claim that they would like to go into livestock farming but that they lack the money necessary to get into the business in good shape. The funds a farmer operates with are in the form of capital goods, cash, or credit. Credit is obtained from banks or other institutions or persons loaning money to farmers, on the basis of the applicants character, capacity, and collateral. The mortgage debt of farmers may therefore be important in determining type of farming. Farmers often obtain funds for construction, development, and operation by mortgaging the farm.

At Hyde Park in 1914, 18 farms out of 52 were mortgaged. The average value of land and buildings per farm mortgaged was $9,559 and the average mortgage debt $1,151, or 12 per cent of the value of the land and buildings. The rate of interest most common was 8 per cent. Fourteen farmers paid 8 per cent, 1 paid 8½ per cent, 2 paid 9 per cent,

(1) Widtsoe, J. A., and Stewart, George, "Western Agriculture", (1918), p. 142.

Table XXXIV.—Mortgage Debt of Farms by Counties, Utah, 1910(1)

Area	For all Farms Operated by Owners			For Martgaged Farms Consisting of Owned Land Only			
	Farms Free from Mortgage	Farms Mortgaged	Farms Giving no Mortgage Report	Number Farms Reporting	Value of Land and Buildings (dollars)	Amount of Mortgage Debt (dollars)	Ratio of mortgage to the value of land and buildings. (Per Cent)
State	15,131	4,492	139	3,526	21,319,580	4,564,175	21.4
Counties							
Beaver	263	21	1	17	117,150	18,980	16.2
Boxelder	869	502	11	369	2,767,325	601,590	21.7
Cache	1,126	621	9	449	3,606,494	672,922	18.7
Carbon	132	21	2	19	97,700	14,520	14.9
Davis	937	261	7	225	1,702,213	363,731	21.4
Emery	447	177	1	166	957,867	206,575	21.6
Garfield	318	31	4	30	101,885	30,065	29.5
Grand	129	26	1	21	154,295	15,198	9.9
Iron	303	23	7	14	85,600	18,280	21.4
Juab	408	68	19	64	327,315	93,992	28.7
Kane	152	12	....	10	37,980	9,180	24.2
Millard	585	75	10	56	220,330	46,560	21.1
Morgan	167	46	....	31	189,040	24,495	13.0
Piute	132	41	1	33	109,250	28,667	26.2
Rich	142	56	....	46	382,455	122,426	32.0
Salt Lake	1,418	454	4	366	1,911,295	396,625	20.8
San Juan	142	9	....	7	26,018	8,300	31.9
Sanpete	1,307	319	2	256	1,177,698	237,972	20.2
Sevier	633	315	3	274	1,312,515	266,324	20.3
Summit	355	51	1	42	305,313	64,585	21.2
Tooele	245	44	....	31	372,065	55,250	14.8
Uinta	457	115	29	105	463,975	99,819	21.5
Utah	1,971	648	22	489	2,675,370	650,040	24.3
Wasatch	790	98	2	81	491,062	118,745	24.2
Washington	553	30	....	21	46,558	7,125	15.3
Wayne	208	23	2	18	58,200	11,195	19.2
Weber	942	369	1	286	1,622,612	381,014	23.5

and 1 paid only 6 per cent interest on the farm mortgage. The average rate therefore, was 8.03 per cent including commissions, when paid. (See Table XXXIII.)

From investigations that have been made here and elsewhere in the State it seems that these farmers might make more money by extending their operations by increasing the number of acres cropped and the number of productive livestock units handled(2). With the operation of the Federal Land Bank at San Francisco and a Local Farm Loan Association in Cache County these farmers should be able to extend their

(1)1910 U. S. Census.

(2)Brossard, E. B., Utah Agr. College Cir. No. 23, and also Utah Agr. Exp. Sta. Bul. No. 160.

operations considerably by using funds obtained by credit based on the farm mortgage.

Under the Federal Farm Loan Act farmers are able to borrow as much as 50 per cent of the value of the land for agricultural purposes and 20 per cent of the value of the permanent insured improvements. At present the interest rate is 5½ per cent. The loan may be obtained for a period of 40 years if desired with the privilege of paying it or any part of it any time after 5 years. Regular payments on the amortization plan are required each year.

In Cache County in 1910.(1), 621 farms were mortgaged, 449 of which consisted of owned land only. The total value of the land and buildings mortgaged was $3,606,494, and the mortgage debt $672,922, or 18.7 per cent of the value of land and buildings. (See Table XXXIV).

Table XXXV.—Farm Mortgages, Utah and the United States, 1910(1)

	Utah	U. S.
Total Farms Reporting	19,762	3,948,722
Farms Free from Mortgage	15,131	2,588,596
Farms Mortgaged	4,492	1,312,034
Farms not Specified	139	48,092
Morgtaged Farms owned wholly by the Operator	3,526	1,006,511
Value of Land and Buildings on Mortgaged Farms	$21,319,580	$6,330,236,951
Amount of Mortgaged Debt	4,564,175	1,726,172,851
Mortgaged Farms owned wholly by the Land and Buildings (per cent)	21.4	27.3
Average Value of Land and Buildings per Farm	6,046	6,289
Average Mortgage Debt per Farm	1,294	1,715
Average Equity per Farm	4,752	4,574

In Utah in 1910(1), of 19,762 farms reporting, 15,131 were free from mortgage, 4,492 were mortgaged, and 139 did not specify. There were 3,526 mortgaged farms wholly owned by the operators. The value of land and buildings on these farms was $21,319,580 and the mortgage debt was $4,564,175, or 21.4 per cent of the value of land and buildings. This ratio for the United States as a whole was 27.3 per cent.

The average value of land and buildings per farm in Utah, 1910, was $6,046 and the average mortgage debt per farm was $1,294 thus leaving an average equity of $4,752 per farm. For the United States as a whole the average value of land and buildings per farm was $6,289, the average mortgage debt $1,715, and the average equity $4,574 per farm. (See Table XXXV).

A fairly accurate estimate(2) of the farm mortgage debt of all Utah farmers in 1914 places it at $6,818,000, of which $6,000,000 or 88 per cent was held by banks, $862,000, or 12.6 per cent, held by life insurance companies, and $340,000 negotiated by banks and bank officials as agents or correspondents for other investors. These figures do not check exactly because they have been arrived at separately and no attempt has been made to force them. It is also estimated that 67 per cent of the farm mortgage business of Utah, pays no commission and 33 per cent of the business pays an average commission of .4 per cent. Of the

(1) 1910 U. S. Census, Vol. 5, Tables 9, 11, and 12.

(2) Thompson, C. W., U. S. D. A., Office of Markets and Rural Organization, Bul. No. 384, (July, 1916), pp. 2, 8, and 10 respectively.

total mortgage business 18.3 per cent pays a commission in advance and 14.7 per cent pays it on the installment plan. The average mortgage rate of interest paid was 8.6 per cent, which makes 9 per cent with the commission. The estimated average interest rate for farm loans on personal security in Utah, 1914 (1), was 8.8 per cent and the estimated average other costs of the loans, 1.6 per cent, making the average estimated total cost, including discounts, bonuses, commissions and any other extra charges, 10.4 per cent. Only in unusual cases can farmers pay this high rate and make a profit in farming.

Farm Profits.—Farm profits are largely determined by the type of farming practised. The type of farming most profitable depends upon the circumstances of the individual farmer and farm. Two of the first questions that arise in one's mind are: (1) Is farming profitable? and (2) How profitable is it?

Table XXXVI shows the average labor income of 52 Hyde Park farmers in 1914. The value of the farm house is included as a part of the capital investment, the increase in the value of land is omitted, and the interest rate used is 8 per cent.

Table XXXVI.—Average Labor Income, 52 Farms, Hyde Park, 1914

Capital Investment	$13,642	
Receipts	$ 2,510	
Expenses	1,882	
Farm Income (Receipts less expenses)		$1,628
Interest on Capital Investment (at 8 per cent)		1,091
Labor Income		$537

At 5 per cent(2), interest is $682 and labor income, $946; at 5½ per cent(3), interest is $750 and labor income $878; at 8 per cent(4), interest is $1,091 and labor income $537; at 8.6 per cent(5), interest is $1,173 and labor income $455; and at 9 per cent (6), interest is $1,228 and labor income $400.

Table XXXVII shows the farmer's pay for management and risk or responsibility taken, 52 farms, Hyde Park, Cache County, Utah, 1914.

Table XXXVIII shows the labor income of the 10 better-paying farms of Hyde Park in 1914. At 5 per cent, interest is $991 and labor income, $1,997; at 5½ per cent, interest is $1,090 and labor income, $1,899; at 8 per cent, interest is $1,585 and labor income, $1,403; at 8.6 per cent, interest is $1,704 and labor income, $1,285; and at 9 per cent, interest is $1,783 and labor income, $1,206.

(1)Thompson, C. W., U. S. D. A., Office of Markets and Rural Organization, Bul. No. 409, (August, 1916), p. 6.

(2)The investigators of the Office of Farm Management, U. S. D. A. use 5 per cent interest for all districts in the United States in calculating labor income. (a) Thompson, E. H., and others, U. S. D. A., B. P. I., Bul. No. 41, (Jan., 1914); (b) Thompson, E. H., and others, U. S. D. A., B. P. I., Bul. No. 117, (July, 1914); (c) Spillman, W. J., and others, U. S. D. A., Farm Mgt. Bul. No. 341, (Jan., 1916); and (d) Connor, L. G., U. S. D. A., Farm Mgt. Bul. No. 582, (Jan., 1918), Note, p. 2.

(3)The Federal Farm Loan Act of July 17, 1916, provides that interest rate on farm mortgage loans shall not exceed 6 per cent, nor be more than 1 per cent greater than the rate on the last issue of farm loan bonds. The present rate on farm mortgages under this act is 5½ per cent.

(4)The most common rate of interest at Hyde Park and in the State.

(5)The estimated average mortgage rate without commission for Utah.

(6)The estimated average mortgage rate including commissions, Utah.

Table XXXVII.—The Farmer's Pay for Management and Risk or Responsibility Taken, Hyde Park, Cache County, Utah, 1914

Number of Farms	52	
Capital Investment(1)	$12,307	
Total Income		$3,183
Farm sales and increase in inventory other than land	2,510	
Value of farm products, food and fuel, used in home(2)	411	
Increase in value of land (105 A. at $2.50 per A.)(3)	262	
Total Subtractions		2,467
Unpaid family labor	204	
Help hired by month or year	56	
Help hired by day or piece	116	
Cash expense for board of hired help	11	
Other cash farm expenses	495	
Opportunity value of farmer's labor(4)	600	
Interest on capital at 8 per cent(5)	985	
Farmer's Pay for Management and Risk or Responsibility taken (Total income minus total subtractions)		716

Table XXXIX shows the farm capital, receipts, expenses, farm income, interest on investment, and labor income of farms of the Hyde Park area, Cache County, Utah, 1915. At 5 per cent, interest on the average capital invested in the 48 farms is $599 and labor income $589; at 5½ per cent, interest is $569 and labor income $529; at 8 per cent, interest is $959 and labor income $229; at 8.6 per cent, interest is $1,031 and labor income $157; and at 9 per cent, interest is $1,076 and labor income $112. The average of the 10 better-paying farms has a labor income of $1,446 with interest at 5 per cent, $1,374 with interest at 5½ per cent, $1,015 with interest at 8 per cent, $920 when interest is 8.6 per cent, and $872 with interest at 9 per cent. The average of the 10 poorer-paying farms had a labor income of minus $93 with interest figured at 5 per cent.

Table XL shows the labor income of farmers of the Hyde Park area, Cache County, Utah, 1916. The labor incomes of the farmers of this

(1)Average capital investment, 52 farms, $13,642; minus $1,335, average value of dwelling, 50 farms.

(2)Funk, W. C., U. S. D. A., Farmers' Bul. No. 635, (Dec., 1914), p. 5, gives $64.19 as the average value per person of food and fuel produced on the farm and consumed in the farm home on 483 farms in 10 representative districts of the United States. At Hyde Park the farmers use about the average amount of fuel and food items mentioned in this bulletin and in addition get their year's supply of wheat for flour which is taken as grist to the mills. The average consumption per person of wheat for flour in the United States in 1914 was about 5 bushels. The average price of wheat in Utah Dec. 1, 1914, was $0.86. The value of wheat used for flour per person was, therefore, 5x$0.86, or $4.30. $4.30 plus $64.19 equals $68.49 per person in the farm family. There were, on the average, 6 persons per family on the farms at Hyde Park, 1914, and 6x$68.49 equals $410.84 per family, or in whole numbers, $411.

(3)1910 U. S. Census shows that in the ten years ending April 15, 1910, land in Cache County, increased in value $24.93 per acre, from $12.92 in 1900 to $37.85 in 1910. This amounts to $2.50 an acre each year. It is assumed that land at Hyde Park increased at this same rate.

(4)Estimated by the farmers. The estimates varied from $200 to $1,000.

(5)The most common rate of interest paid at Hyde Park and elsewhere in Utah.

Table XXXVIII.—Business Statement of the Average of 10 Better-Paying Farms of the Hyde Park Area, Cache County, Utah, 1914, Showing Type of Farming and Labor Income

Farm Capital	No.	Value
Total acres in farm	226	$16,152
Cattle (including milk cows)	27	1,225
Horses and colts	10	1,204
Sheep	1	4
Hogs	6	72
Poultry	77	35
Machinery		542
Feed and supplies		542
Cash		51
Total Farm Capital		$19,816
Farm Receipts		
Crops		
Sugar-beets		$ 1,070
Grain		908
Potatoes		190
Hay		59
Fruits and Vegetables		16
Livestock		
Dairy products		623
Cattle(1)		399
Horses(1)		194
Hogs(1)		116
Poultry(1) and eggs		64
Miscellaneous receipts		348
Increase in feed and supplies		146
Total Farm Receipts		$ 4,133
Farm Expenses		
Hired labor(2)		$ 288
Value of family labor(3)		272
Cash rent and forest reserve fees		127
Taxes		117
Machinery repairs and depreciation		33
Building and fence repairs and depreciation		12
Feed		50
Horseshoeing and veterinary fees		30
Breeding fees and seeds		58
Threshing and twine (excludes toll)		72
Machine work hired		6
Water tax		24
Miscellaneous expenses		56
Total Farm Expenses		$ 1,145
Farm Income (receipts minus expenses)		2,988
Interest on total farm capital (at 8 per cent)		1,585
Labor Income		1,403

(1)The receipts from stock are found by subtracting the sum of the purchases and what is on hand at the beginning of the year from the sum of the sales and that on hand at the close of the year.

(2)Includes cash expense of boarding hired labor.

(3)Except that of the operator of the farm.

Table XXXIX.—Business Statement of Farms of Hyde Park Area, Cache County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 48 farms
Farm Capital			
Real estate(1)	$11,396	$10,438	$ 9,471
Livestock	2,062	1,410	1,629
Machinery and tools	489	405	469
Feed and seeds	376	422	344
Cash	35	13	74
Total Farm Capital	$14,358	$12,688	$11,987
Farm Receipts			
Crops	$ 1,569	$ 958	$ 1,049
Livestock	1,074	336	692
Miscellaneous receipts	413	92	233
Increase in feed and seeds inventory	84	0	13
Total Farm Receipts	$ 3,041	$ 1,386	$ 1,987
Farm Expenses			
Current farm expenses	$ 789	$ 604	$ 693
Depreciation in mach., bldgs., fences	88	121	106
Decrease in inventory of feed and seeds	0	120	0
Total Farm Expenses	$ 877	$ 845	$ 799
Farm income (receipts-expenses)	$ 2,164	$ 541	$ 1,188
Interest on total farm capital (at 8 per cent)	$ 1,149	$ 1,015	$ 959
Labor income	$ 1,015	$ −474	$ 229

area are better than the average of the State and perhaps some better than the average of the country as a whole. The business is about the same each year and tho there are always a few who make very little if anything, the profits of the majority are normal.

Table XLI shows the average, total, and yearly labor income of each of 32 Hyde Park farmers who coöperated for each of the three years, 1914, 1915, and 1916. They are separated into three groups, the 10 better-paying farms, the 12 medium-profitable farms, and the 10 least-profitable farms. It should be noted that in general the farms which have a high-average labor income have also a large one for each of the three years and those having a low-average have also a small labor income each year. There are, however, some farmers whose labor income has varied greatly. In these cases special conditions and circumstances have been the cause. The following facts from two farm statements illustrate this point.

Farm 2, L-6, was less successful in 1915 because of failure of dry-farm wheat. Farm 4, L-2, was not so successful in 1915 on account of having only $42 worth of potatoes to sell instead of the $250 worth as in 1914, as but one instead of two and a half acres was planted. His livestock was not nearly so profitable in 1915 because of misfortune with calves, colts, and pigs. And his expenses were $500 greater. The increase in expenses was due to a grown son's help on the farm for a longer period, thus lightening the labor of the operator, but increasing

(1) Real estate includes all land, buildings, fences, drains, etc., at their market value at the beginning of the farm year, or January 1, 1915.

Table XL.—Business Statement of Farms of Hyde Park Area, Cache County, Utah, 1916, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 32 farms
Farm Capital			
Real estate			
Land	$ 9,362	$ 7,114	$ 8,185
Buildings	1,148	1,433	1,516
Livestock	2,324	1,149	1,534
Machinery	416	374	395
Feed and supplies	509	338	377
Total Farm Capital	$14,059	$10,408	$12,056
Farm Receipts			
Crops			
Potatoes	$ 3	$ 4	$ 23
Grain	761	197	368
Sugar-beets	1,013	557	793
Hay	12	1	—
Other Crops	—	—	9
Livestock			
Dairy products	642	294	453
Poultry and egg sales	33	34	35
Cattle sales	299	137	204
Horse sales	121	60	129
Sheep sales	—	3	1
Swine sales	49	20	24
Other receipts	331	104	214
Increase in livestock inventory	287	—	—
Increase in feed and supplies	224	—	38
Total Farm Receipts	$ 3,775	$ 1,411	$ 2,291
Farm Expenses			
Blacksmith and machine work	$ 57	$ 55	$ 51
Hired labor	118	110	127
Mach., bldg., and fence material	31	46	43
Feed and seeds	132	31	85
Fees, rents, and taxes	181	151	153
Other expenses	128	55	72
Livestock purchased	68	46	55
Decrease in livestock inventory	—	187	46
Decrease in machinery inventory	46	1	11
Decrease in feed and supplies	—	42	—
Decrease in land and buildings	44	26	35
Value of family labor	115	130	87
Total Farm Expenses	$ 920	$ 880	$ 765
Farm income (Receipts-Expenses)	2,885	531	1,526
Interest on Total Farm Capital (at 8 per cent)	1,125	833	964
Labor Income	1,760	−302	562

the expense for unpaid family labor, and to the fact that $272 worth of hay was purchased because of the unusually cold winter making more feed necessary, the drought in July and August "burning up" the ranges,

Table XLI.—Labor Incomes(1) of 32 Farmers, Hyde Park, Cache County, Utah, 1914, 1915, and 1916

Order	Farm Number	Labor Income Average	Total	1914	1915	1916
1.	B-3	$3,419	$10,257	$1,949	$2,435	$5,873
2.	L-6	2,831	8,494	4,277	345	3,872
3	P-2	1,857	5,570	1,301	1,629	2,640
4.	L-2	1,559	4,678	2,226	950	1,502
5.	W-2	1,487	4,462	1,306	1,703	1,453
6.	H-2	1,276	3,827	1,840	1,172	815
7.	L-1	1,267	3,801	1,395	1,185	1,221
8.	C-1	1,169	3,506	1,004	1,123	1,379
9.	L-3	1,084	3,251	1,644	1,043	564
10.	S-3	1,083	3,248	1,287	1,167	794
Total		17,032	51,094	18,229	12,752	20,113
Average		1,703	5,109	1,823	1,275	2,011
11.	A-1	1,027	3,080	1,772	154	1,154
12.	W-1	988	2,963	1,537	1,126	301
13.	N-1	942	2,826	947	1,022	857
14.	J-1	928	2,783	928	251	1,504
15.	S-4	841	2,524	850	659	1,015
16.	R-1	787	2,360	1,425	643	292
17.	S-5	773	2,319	889	468	962
18.	K-2	732	2,196	1,065	399	732
19.	K-1	681	2,043	1,166	883	−6
20.	D-1	622	1,865	768	698	399
21.	G-1	613	1,839	654	437	748
22.	B-2	557	1,672	1,039	296	337
Total		9,491	28,470	13,040	7,036	8,395
Average		791	2,372	1,087	586	700
23.	W-5	514	1,543	775	738	30
24	R-2	492	1,476	708	299	469
25.	H-3	419	1,257	843	210	204
26.	H-1	418	1,253	484	57	712
27.	C-3	207	620	483	104	33
28.	L-4	153	459	- 58	327	190
29.	P-1	67	202	63	- 50	189
30.	C-4	- 40	- 121	86	-153	- 54
31.	S-2	- 105	- 315	156	-130	-341
32.	F-1	- 222	- 666	2	-237	-431
Total		1,903	5,708	3,542	1,165	1,001
Average		190	571	354	116	100
Grand Total		28,426	85,272	34,811	20,953	29,509
Grand Average		888	2,665	1,088	655	922

and to the fact that he raised but 46 tons of hay instead of 54 as in 1914, due to fewer acres planted.

The variations in labor income from year to year on an individual

(1) 5 per cent interest on investment was subtracted in calculating labor income.

farm result from the various causes which affect farm profits on different farms, because each year, in a measure, presents an entirely new set or combination of conditions which the farmer has to meet and over a great many of these factors he has no control whatever.

The landlords, who rented out their land to farmers that wanted it to work with their own farms, received on the average between 6 and 7 per cent net return on the investment. The owner usually pays the taxes on rented land, which average about 0.8 per cent at Hyde Park for both land and water, and these with all other expenses have been deducted. The percentage which the net rent forms of the total investment varied from 3 to 18.

With land values increasing as they have in the past, at the rate of about $2.50 per acre annually, and an annual income of 6 to 7 per cent on the investment, owning Hyde Park farm land has been profitable. Men would buy farm land in preference to loaning their money on farm mortgages if interest rates were considerably higher than 8 per cent because of the rise in land value and the rent they are able to get from its use in farming.

Table XLII shows the labor income(1) of Utah farmers for the year 1909 as calculated from the 1910 U. S. Census. Using 0.5 per cent as the tax rate and 5 per cent interest the labor income was $322. Using 0.6 per cent as the tax rate and 5 per cent interest the labor income was $313. Using 0.8(2) per cent tax rate and 8 per cent interest labor income was $88. With interest at 8.6 per cent, labor income was $47, and with interest at 9 per cent, labor income was $19.

In calculating this labor income no credit or debit was made for increase or decrease in the value of farm land. This increase or decrease is an important factor in the farmer's income. The 1910 U. S. Census shows that in the decade 1900 to 1910 farm land in Utah increased in value at the rate of 11.625 per cent compounded annually on the 1900 value(3). In Minnesota farm land increased at the rate of 5.6 per cent compounded annually on the 1900 value(4). In the United States as a whole, it increased at the rate of 5.621 per cent compounded annually. The average increase in the value of an acre of land each year for the decade 1900 to 1910 was in Utah, $1.95; in Minnesota, $1.55; and in the United States as a whole, $1.68. The average labor income of farmers of the United States as a whole for the year 1909 was $318(5). Taxes were figured at 0.6 per cent and interest at 5 per cent. Using 0.5 per cent as tax rate and 5 per cent interest the average labor income of Minnesota farmers for the same year was $330(6).

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(1)Method of calculation is that used by W. J. Spillman in U. S. D. A. B. P. I., Cir. No. 132, (July, 1913); and by F. W. Peck in Minn. Farm Management Service Notes, Cir. No. 2, (March, 1914). Includes unpaid family labor and all the farm furnishes towards the family living except milk. Does not include income from outside sources; and the amount paid for livestock bought must be deducted.

(2)Third An. Rpt., Utah Bur. Immig. Lab. and Stat., (1917), p. 350, shows that the State and State School tax levy was 8 mills in 1909. The average taxes paid by the 10 better-paying farms in each of 6 areas in 1914 was 8.2 mills on each dollar invested in the farm business.

(3)Brossard, E. B., Utah Exp. Sta. Bul. No. 160, (Sept., 1917).

(4)Boss, A., and Benton, A. H., and Cavert, W. M., Minn. Exp. Sta. Bul. No. 170, (Oct., 1917).

(5)Spillman, W. J., U. S. D. A., B. P. I., Cir. No. 132, (July, 1913).

(6)Peck, F. W., Minn. Farm Mgt. Service Notes, Cir. No. 2, (March, 1914).

Table XLII.—Labor Income of Utah Farmers, 1909
(1910 Census Report)

Item		Total	Per farm
Number of farms		21,676	156.7(1)
Improved land (acres)		1,368,211	63.1
Total Farm investment		$150,795,201	$6,957
Land		99,482,164	4,590
Buildings		18,063,168	833
Machinery		4,468,178	206
Livestock		28,781,691	1,328
Receipts			
Dairy products (excluding milk and cream used at home on the farm)		$ 2,067,534	$ 95
Poultry and eggs produced		1,259,267	58
Honey and wax produced		79,763	4
Wool and mohair produced		1,891,221	87
Animals sold		5,899,382	272
Animals slaughtered		756,854	35
Total value of all crops	$18,484,615		$853
Corn	$ 134,396	$ 6	
Oats	1,671,065	77	
Barley	472,816	22	
Hay	7,429,901	343	
Total value of feed crops	$ 9,708,178		$448
Receipts from sale of feed crops	1,336,199		62
Net value of crops fed	$ 8,371,979		$386
Net value of crops		10,112,636	467
Total gross farm income		$22,066,658	$1,018
Expenses			
Labor		$ 2,863,709	$ 132
Rent and board furnished		306,208	14
Fertilizer		20,037	1
Feed		727,409	34
Maintenance of buildings (at 5½ per cent of value)		993,474	46
Maintenance of machinery and implements (20 per cent of value)		893,636	41
Taxes (0.8 per cent)		1,206,362	56
Total		$ 7,040,805	$ 324
Miscellaneous expenses (15 per cent of other expenses)		1,056,121	49
Total Farm Expenses		$ 8,096,926	$ 373
Summary			
Total gross farm income		$22,066,658	$1,018
Total farm expenses		8,096,926	373
Net farm income		$13,969,732	$ 645
Interest on investment (at 8 per cent)		12,063,616	557
Labor income		$ 1,906,116	$ 88

(1) Average Total acres per farm.

Summary.—Special mention should be made of some of the principal points concerning the type of farming at Hyde Park. The combinations of enterprises are the result of the "survival of the fittest" in the competition of enterprises for a place in the farm business. The number of livestock in the area is increasing but its increase depends largely upon the development of the farm pastures and the improvement of the ranges and of necessity is gradual. The climate, soil, and topography limit the use of much land in this area to the grazing of livestock. The farm business of the area is diversified and fairly well balanced when all of the farm, family, and labor conditions are taken into consideration. The size of farm business is not great, but it is based upon the farm family as the unit of organization, and seems in most cases to be fairly well adapted to the conditions. The farm machinery and buildings are similar to those found on farms elsewhere in the country. One distinctive feature, which has a decided effect upon the type of farming, is the location of the farm buildings and the farm family in town instead of on the farms.

The administration of the National Forests by the Federal Government limits the use of the range to land-owning farmers and establishes priority of rights on the ranges and protection for these rights and thus influences the type of farming practised on some farms. The National Forests and range-stock farming are closely correlated.

The population and the character of the individual persons have affected the type of farming at Hyde Park by limiting markets for some farm products, establishing markets for others, and by determining the abilities and training of farmers to produce successfully the crops and livestock wanted. The farmer and his family do most of the farm work. The families are large and the children contribute considerably to the family income by milking cows and working in the sugar-beets. The sugar-beet enterprise was made possible by the establishment of Sugar Factories.

No tenant farms are included in this investigation. Some owners rent additional land. The percentage of tenancy is low in Cache County and Utah because (1) it is a relatively new country and until recently it was easy for one to become an owner and thus take advantage of the rise in the value of land; (2) the natural sentiment of the people is against tenancy and in favor of owning their own homes and businesses, for religious and social as well as economic reasons; and (3) the type of farming practised and range and water conditions all tend to make it desirable to own all or a large part of the farm land one operates. Even tho land values are based upon the productivity of the land, the farmer on a given farm must select such farm enterprises as will be profitable on his land, and thus on the individual farm, land values determine to some extent the type of farming.

The irrigation water available, the ownership and operation of irrigation canals, the duty of water, the amount of water required by crops, and the proper times of applications on the various crops are all factors influencing the type of farming at Hyde Park.

The farm credit institutions and the available money for farm operations undoubtedly are important factors influencing type of farming in individual cases, but with the operation of the Federal Land Bank some of the credit needs of these farmers may be met.

All the foregoing factors and many others influence the type of farming and thus farm profits. At Hyde Park, profits are not phenominally high nor discouragingly low. On the average they allow a good living for the farm family and in addition farmers are "getting ahead."

BEAVER, BEAVER COUNTY, UTAH

The seven remaining areas are treated briefly, and each compared with Hyde Park. Some outstanding points of difference and similarity are noted.

The city of Beaver is situated about 300 miles west of south of Hyde Park. It is in the eastern part of the southeast quarter of Beaver County, in township 29 south, and range 7 west of Salt Lake Meridian.

The elevation at Beaver is 6000 feet or about 1500 feet higher than Hyde Park.

Table XLIII.—Tenure and Use of Farm Land per Farm, 50 Farms, Beaver, Beaver County, Utah, 1914

Item	Farms Reporting	Average Acres(1) 50 Farms	Average Acres(1) Farms Reporting
Farm Area	50	179	185
Owned by Operator	48	174	123
Cash-rented Land	4	3	34
Share-rented Land	5	3	25
Crops	50	67	67
Pasture	44	27	31
Summer Fallow	2	0	5
Farmstead and Waste	48	12	12
Uncultivated	16	71	222
Irrigated Land			
Garden	12	0	1
Carrots	2	0	0
Corn for Grain	11	0	2
Corn for Silage	2	0	2
Potatoes	38	1	1
Spring Wheat	36	5	7
Winter Wheat	2	0	7
Rye	2	0	7
Oats	33	7	10
Barley	20	2	4
Oat Hay	9	2	10
Hay	18	5	14
Wild Hay	18	11	30
Alfalfa	49	33	33
Oats and Peas	4	1	8
Peas	2	0	1
Cabbage	2	1	14
Beets	2	0	1
Apples, not Bearing	2	0	1
Apples, Bearing	1	0	0
Beans and Alfalfa	1	1	29
Plums	1	0	0
Berries	1	0	0

Table XLIII shows the tenure and use of farm land at Beaver in 1914. On the average there were 179 acres to the farm, of which about 174 acres were operated by the owners, 3 acres cash rented, and 3 acres share rented by the operator. About 69 acres were in crops, 27 acres were in pasture, 71 acres were uncultivated, and 12 acres were in the farmstead, roads, lanes, ditches, and other waste land. There was no land dry-farmed in this area in 1914.

(1) Areas are given to the nearest acre.

Based on acreage, alfalfa was the main crop occupying 33 acres. Wild hay occupied 11 acres and other hay 5 acres, and oat hay 2 acres, or a total including alfalfa of 51 acres in hay, or 75 per cent of the total area in crops. Other crops and acreages grown are: oats, 7; spring wheat, 5; barley, 2; potatoes, 1; oats and peas, 1; cabbage, 1; and fruit and other vegetables, 1. The significant fact about the crops grown is the large acreage in hay. This hay is grown largely for feed for livestock. Dates of farm crop operations are shown in Table XXXVII in Appendix.

Table III in Appendix shows the capital, receipts, expenses, and labor income of the average of 10 better-paying farms. It shows livestock and stock products to be the main sources of income.

However, some hay, grain, a few potatoes, and a little fruit are sold. The crops sold are consumed locally. Some feed, $47 worth, was bought locally, and cash rent and Forest Reserve fees amounted to $18. Expenses for hired labor were $600, and for unpaid family labor $96, or a total labor expense of about $696 besides that of the operator of the farm.

The two main sources of income on the average farm as well as on the average of the ten better-paying farms were cattle and sheep as shown in Table IV in Appendix. The better-paying farms had a larger business and their livestock was more productive in proportion to feed fed. Man and horse labor were both more efficient on the better-paying farms than on the average farm.

Tables V, VI, and VII in Appendix show the same facts about the type of farming in this area for the years 1915 and 1916 as was shown extant in 1914. However, the labor income of the farmers was greater, on the average, in 1915 than 1914 and greater in 1916 than 1915. The average labor income on all 44 farms in 1916 was $711. The average of the ten least-profitable farms was minus $613, and of the ten most-profitable farms it was $2537.

The farm business at Beaver is well diversified. Cattle, sheep, dairying, and feed and a surplus of hay, grain, and potatoes as cash crops make a fairly well balanced business. During the winter months, however, many farmers' sons spend too much of their time in town playing pool, etc., instead of at productive farm labor.

The Beaver farms are larger than the Hyde Park farms but the type of farming is more extensive at Beaver. At Hyde Park there are more acres of intensive crops and more dairy cows and fewer acres of hay and fewer range cattle and sheep.

The average value of farm machinery on each farm is greater at Beaver than at Hyde Park. This is another reason for the fewer men and horses in proportion to acres of crops and number of animal units at Beaver than at Hyde Park.

The value of farm buildings is slightly less at Beaver than at Hyde Park due in part, to warmer climate, more recent settlement, and fewer dairy cows.

The average crop-growing season is 25 days shorter than at Hyde Park. The mean annual temperature is 48.5 degrees F. or about 1 degree higher than for Hyde Park. The temperature is warmer in summer and not so cold in winter at Beaver. The annual precipitation is only about 13 inches at Beaver. All the crops are irrigated.

The Beaver farm-land begins at the base of the mountains on the east and south and extends out west and north to the bottom of the valley, where seepage and excess irrigation water has resulted in some of the low-lying land becoming too wet to be utilized in its present condition, for other purposes than permanent meadow or pasture. The land is practically level but slopes gently towards the bottom valley-land from the bench land.

This land is in the Great Interior Soil Province(1). (See Fig. 15). The soil has the characteristics of arid soils in general(2).

The Fillmore National Forest is easily accessible to the cattle and sheep of the Beaver farmers(3). The Millard Desert affords winter sheep-range near at hand. However, these ranges are now stocked to their capacity, and must be handled more carefully or they will not even maintain their present carrying capacity.

The population of the city of Beaver was 1899 in 1910(4). A large proportion of those persons in the population who were born in the United States came from other parts of Utah, and other western and middle western states, to Beaver. The foreign-born population is largely from northern Europe and Great Britain. Practically the same situation prevails here as was found at Hyde Park.

The average number in the farm families on the farms at Beaver in 1914 was 5.4. Of these 2 were less than 16 years old and 3.4 over 16 years of age.

The average number of men employed per farm was 1.4. That is the operator's full time and the equivalent of 0.4 of a year of other man labor performed either by other members of the farm family or by hired help. This is two and one-half months less man labor than was utilized at Hyde Park.

Table XLIV.—Size of Family and Number of Cows Kept, Beaver, Beaver County, Utah, 1914

Size of Farm Family(5)	Number of Farms in Group	Average Number of Persons per Family	Average Age of Farm Operator (years)	Persons Over 16 Years of Age on Farm	Number of Farms with Cows	Average Number Cows per Farm
All Farms.....	48	5.4	49.4	3.5	45	9.1
Small	16	3.2	47.8	2.6	16	8.8
Medium	15	5.5	47.3	3.5	13	9.0
Large	17	7.5	52.8	4.3	16	9.5

The cows shown in Table XLIV are in most cases just common grade shorthorn cows. Many of them were range cows that were milked only a few months. It was impossible from the records taken to get accurately the average number of cows milked on each farm for the year or 12 month basis. Records of the two largest range cattle operators, one reporting 96 cows and one 80 cows were omitted from the table because it was so evident that their cows were not all milked even for a

(1) Whitney, Milton, U. S. D. A., Bu. of Soils Bul. No. 55, (1919), pp. 83, 89-91, and 169-188, and soil map of U. S. accompanying it.

(2) Coffey, George Nelson, U. S. D. A., Bu. of Soils Bul. No. 85, (1912), pp. 38-41.

(3) See Fig. 17.

(4) Thirteenth U. S. Census.

(5) The Small Farm Families had from 1 to 4.9 members, the Medium Farm Families had from 5 to 6.9 members, and the Large Farm Families included those having from 7 to 9 persons each.

few weeks out of the year. Nevertheless the table shows correlation between the size of farm family and number of cows kept for breeding and milk purposes.

In 1914 there were on the average 46 productive animal units per man and 46 crop-acres per man. This seems to show that man labor was unusually efficient with stock and crops. But as before stated this is largely due to extensive use of ranges for stock, and growing crops requiring but little man labor. It is also due in part to growing crops that permit of the use of machinery for most of the operations. There were 16 crop-acres per work horse here and only 14 at Hyde Park. The reasons for this apparent horse efficiency are the same as those stated above for man labor efficiency.

Beaver City is 32 miles from Milford, the nearest railway station, but there are good dirt-roads the year round. The main auto highway between Salt Lake City and Los Angeles, called the Arrowhead Trail, passes thru Beaver.

The greater part of the farm products are marketed or fed on the farm. Livestock, however, are driven to the railroad and shipped to Los Angeles, Salt Lake, Ogden, Kansas City, Omaha, or Chicago. Eggs and farm made butter are sold to general merchandise stores at Beaver and are taken by them in auto-trucks to Milford for shipment to Salt Lake and elsewhere. Some eggs and butter are sold in the mining camps near Beaver. Some cream is sold in Beaver and some in the mining camps. Th few surplus potatoes are shipped via Milford. The distance from the individual farms to Beaver Post Office varies from one-eighth to four miles so none of them are a great distance from a local market.

Of the 50 farms investigated in 1914, 48 reported all or a part of the land operated as being owned by the operator, 4 reported some land cash-rented, and 5 reported some land share-rented. The average area per farm of the owned land was 174 acres and about 3 acres cash and 3 acres share rented, or 179 acres in the total farm area. The 4 farms reporting land rented for cash rented an average of 34 acres per farm or 136 acres in all. The 5 farms reporting land rented on shares rented 125 acres in all or 25 acres per farm.

The Thirteenth U. S. Census reports 319 farms in Beaver County having an average of 144.2 acres each. Of these farms 285 or 89.3 per cent were reported as operated by the owners, 28 by share tenants, 3 cash tenants, 2 managers, and 1 not specified.

The average value of land and buildings per acre was $43 in 1915. The average amount invested in real estate was $8,174 and the working capital was $4,471 on the average of 40 farms. Table XXIII shows that the value of Hyde Park land and buildings per acre was $106, or about 2½ times as much as at Beaver. The low price of land and extensive farming go together. The high value of land is a result of the greater profitableness of the more intensive type of farming. Farmers cannot afford to do extensive farming on high priced land.

The facts given concerning water-tenure, water-rights, canal ownership and operatioin, and duty of water at Hyde Park also apply generally to Beaver. The irrigation practices are also similar in the two places.

Only 7 farms out of 50 investigated reported mortgages. The interest rates paid varied from 5 to 9 per cent. One farmer paid 5 per cent, 2 paid 6 per cent, 1 paid 7 per cent, 1 paid 8 per cent, and 2 paid 9 per cent interest on the money obtained by mortgaging. This is an average of 7.14 per cent interest paid by these farmers. Using 7.14 per cent as interest rate and the average labor income of the 50 farmers in 1914 was $92. Using 5 per cent interest the labor income was $396, using 5.5 per cent, labor income was $325, using 8.6 per cent, labor income was minus $114, and using 9 per cent labor income was minus $170. The labor income was greater in 1915 than in 1914, and greater

in 1916 than in 1915 as shown by Tables III, IV, V, VI, and VII in Appendix. This was due largely to increase in prices of farm products.

In 1916 the average labor income of the farmers of this area was greater than the average labor income of the farmers of the Hyde Park area. This variation in labor income was undoubtedly due largely to the changes in the relative prices of farm products and to the variation in the successes and the failures in each area of the various crop and stock enterprises.

The type of farming at Beaver is more extensive than at Hyde Park largely because of climate, soil, markets, National Forest ranges and winter ranges, and competing farm enterprises. Livestock, cattle and sheep, are the principle enterprises because of distance to market and low cost of livestock production. Alfalfa and other hay are the principal crops grown because of cattle and some sheep requiring winter feed. Other crops grown here are not important.

MONROE, SEVIER COUNTY, UTAH

Monroe is in Sevier County, three miles from Elsinore, the nearest railway station. Elsinore is on the Marysvale Branch of the Denver and Rio Grande, or Rio Grande Western Railroad.

Monroe had a population of 1227 in 1910. Here as at Hyde Park and Beaver most of the farm families live in town.

The elevation at Monroe is 5380 feet above mean sea level or about 900 feet higher than at Hyde Park.

In spite of the fact that Monroe is more than 200 miles farther south than Hyde Park the average length of the growing season is 110 days, or 40 days less and two weeks later than at Hyde Park. The mean annual temperature is 48° F. or 0.5° F. less than for Beaver and about 0.4° F. greater than for Hyde Park. The average annual precipitation is 8.34 inches, only 3.84 inches of which fall from April 1 to September 30. On this account dry-farming is not practised. All crops are irrigated. The average date of last killing frost in spring is May 28, as compared with May 10 at Hyde Park.

This area is in the Great Interior Basin Soil Province. (See Fig. 15). A soil survey has been made in the Sevier Valley, the report of which gives a detailed description of the soils of this area(1).

The irrigation canals are owned and operated by the farmers who use the water. As in each of the areas already discussed there is here also some low wet meadow and pasture land due to over irrigation and seepage water.

There is a sugar factory at Austin which is three miles north of Monroe. This factory makes it possible for Monroe farmers to grow sugar-beets. A cooperative cheese factory is situated at Monroe so that dairying is also developing here. One of the main auto roads of the State running north and south passes thru town. The wagon roads are usually in good condition. The distance from the farm to market for the most important product varies from one-half to seven miles.

Monroe is not as handicapped as Beaver respecting markets, nor is it quite as well situated as Hyde Park. But as with Beaver the main farm enterprises here are sheep and cattle because of the distance to any large market and the low cost of livestock feed. The special feature of this area is the raising of February lambs for the early Los Angeles market. (See Tables VIII to XII in Appendix). Los Angeles buyers are on the ground at selling time and usually pay fair prices for these early lambs.

Table XLV shows that at Monroe as at Hyde Park there is a direct

(1) Gardner, F. D., and Jensen, C. A., U. S. D. A., Bu. of Soils, Field Operations, (1900).

Table XLV.—Size of Family, Acres Sugar-beets Raised, and Cows Milked, Monroe, Sevier County, Utah, 1914

Size of Farm Family(1)	Number of Farms in Group	Average Number of Persons per Family	Average Age of Farm Operators (years)	Number of Farms Raising Beets	Average Acres Beets per Farm	Number of Farms with Milk Cows	Average Number Cows per Farm
All Farms	66	6.5	47.8	54	7.7	64	5.9
Small	20	3.8	46	14	6	19	3
Medium	26	6.5	48	23	7	26	6
Large	20	9.2	49	17	10	19	8

correlation between the number in the farm family, the number of acres of sugar-beets raised, and the number of cows milked.

Table XLVI.—Tenure and Use of Farm Land per Farm, 66 Farms, Monroe, Sevier County, Utah, 1914

Item	Farms Reporting	Average Acres(2) 66 Farms	Average Acres(2) Farms Reporting
Farm Area	66	64	64
Owned by Operator	66	58	58
Cash-Rented Land	12	4	23
Share-rented Land	7	2	17
Crops	65	47	48
Pasture	26	7	18
Summer Fallow	4	1	10
Farmstead & Waste	62	6	6
Uncultivated	2	2	52
Irrigated Crops	66	46	—
Corn for Grain	6	0	1
Spring Wheat	52	6	7
Potatoes	41	1	1
Barley	2	0	5
Oats	51	4	6
Hay	11	1	12
Wild Hay	0	0	0
Alfalfa	62	28	30
Sugar-beets	55	6	8
Peaches	1	0	0
Apples, not Bearing	1	0	0
Apples, Bearing	9	0	1
Cherries	1	0	2
Onions	1	0	1
Garden	7	0	1
Beans	1	0	1
Berries	1	0	1

(1)The Small Farm Families had from 2 to 5.9 members, the Medium Farm Families had from 6 to 7.9 members, and the Large Farm Families included those having from 8 to 13 persons each.

(2)Areas are given to the nearest acre.

The most important sales are sheep and cattle. Sheep is by far the most important source of income. The reasons for the comparative importance of the sheep industry here are the isolation from large markets for cash crops and the convenience to summer range on the Fishlake and Fillmore National Forests and winter range on the Millard and Beaver County Deserts which make possible a low cost of production. Dairying and sugar-beet raising are becoming more important as markets for cheese are found that permit payment of sufficiently high prices for milk, and as prices for sugar-beets raise in proportion to the cost of production.

Based on acreage, the crops grown rank as follows: (1) alfalfa 1585 acres, (2) sugar-beets 403 acres, (3) spring wheat 329 acres, (4) oats 267 acres, (5) timothy and other hay 103 acres, (6) potatoes 51 acres, (7) rye 7 acres, (8) corn 3 acres, and (9) barley 2 acres. More than 61 per cent of the land was growing hay most of which was alfalfa. Sugar-beets and some wheat were grown as cash crops. Oats, rye, and barley were grown for feed. The potatoes and corn were grown for home use and to supply the local market.

The average labor income of the Monroe farmers in 1914 was $516 with interest charged at 5 per cent, $363 with interest at 5.5 per cent, $132 with interest at 8.6 per cent, and $89 with interest figured at 9 per cent.

In 1914 these farms were less profitable than those at Hyde Park and more profitable than those at Beaver. In 1915 and 1916 however, these farms were more profitable than either those at Hyde Park or those at Beaver. This variation in profitableness is undoubtedly due to variation in the success of producing crops and stock and also to the variations in the market prices of the farm products. The high prices of wool and meat have made the war years very profitable for the Monroe farmers.

SANDY, SALT LAKE COUNTY, UTAH

Sandy is about 20 miles south of Salt Lake City. In 1910 it had a population of 1037. Draper is south of Sandy. The farm business records treated in this area were taken in the townships of Sandy, Draper, Midvale, Jordan, and West Jordan.

The elevation at Sandy is 4366 feet above mean sea level.

The normal annual precipitation is 16 inches, 7 of which fall in the crop-growing season. There are 89 days with 0.01 inch or more precipitation and the mean annual temperature is 51.4° F. The number of rainy days, the amount of precipitation, and the mean annual temperature are higher than for any other of the 8 areas in this study. As at Hyde Park, dry-farming is also practised here on land for which there is no irrigation water and on that which is poorly situated with reference to the water, provided the soil is of a character to produce profitable crops. The average growing season is 183 days, or is more than 30 days longer than in any other of the 8 areas. The average date of last killing-frost in the spring is April 19.

This area is in the Great Interior Basin Soil Province. There has been a detailed soil survey made in this valley(1) but not all of this area was included in that survey. However, typical soils are described and are suggestive. The soil types identified are Jordan sandy loam, Bingham gravelly loam, Jordan loam, Jordan clay and clay loam, Jordan meadows, Jordan sand, Bingham stony loam, and Salt Lake sand. The farmers described the soils as clay, adobe clay, clay loam, sandy, sandy loam, clayey sandy loam, and black sandy loam. At Sandy the soil is predominantly sandy and sandy loam. Near the mountains it is coarser

(1)Gardner, F. D., and Stewart, John, U. S. D. A., Bu. of Soils, Field Operations, (1899).

Table XLVII.—Tenure and Use of Farm Land per Farm, 72 Farms, Sandy, Salt Lake County, Utah, 1914

Item	Farms Reporting	Average Acres(1) 72 Farms	Average Acres(1) Farms Reporting
Farm Area	72	105	105
Owned by Operator	70	85	88
Cash-rented Land	14	7	38
Share-rented Land	12	11	66
Crops	72	56	56
Pasture (woods)	11	21	139
Pasture (perm. tillable)	38	4	8
Pasture (not tillable)	25	8	23
Summer Fallow	9	6	46
Farmstead & Waste	72	6	6
Uncultivated	2	3	94
Dry-farm Land	38	16	—
Winter Wheat	12	9	51
Barley	17	1	5
Summer Fallow	9	6	46
Irrigated Crop-land	72	48	—
Corn	44	3	4
Potatoes	68	3	3
Spring Wheat	56	7	9
Oats	61	11	13
Hay	21	2	7
Timothy and Clover	12	2	12
Alfalfa	61	14	17
Sugar-beets	31	3	7
Squash	6	0	1
Mangels	14	0	1
Onions	6	0	0
Apples, not Bearing	14	1	3
Apples, Bearing	33	1	2
Garden	20	0	1
Berries	12	0	2
Apricots	5	0	1
Peaches	10	0	2
Tomatoes	21	1	2
Melons	6	0	1
Carrots	3	0	1
Peas	7	0	2

until at the base coarse gravel is found. When irrigated and well drained these soils are very fertile as evidenced by the crop yields. Some of the land is low and wet and crop yields are low on such fields.

Table XLVIII shows a direct correlation between the number in the farm families on the farm and the number of cows milked but does not show such correlation between size of family and number of acres of sugar-beets per farm.

One reason there is not much correlation here between the size of farm family and acres of sugar-beets is because two fairly young farmers are exceptional in that they have a business very much larger than the average in every way and they fall in the class with medium-sized

(1) Areas are given to the nearest acre.

Table XLVIII.—Size of Family, Acres Sugar-beets Raised, and Cows Milked, Sandy Area, Salt Lake County, Utah, 1914

Size of Farm Family(1)	Number of Farms in Group	Average Number of Persons per Family	Farm Operator Average Age of (years)	Number of Farms Raising Beets	Average Acres Beets per Farm	Number of Farms With Milk Cows	Average Number Cows per Farm
All Farms.....	72	5.9	45.9	29	7.5	70	4.5
Small	24	3.4	44	11	5	22	2
Medium	32	6.0	47	12	10	32	5
Large	16	9.6	45	6	7	16	7

farm families. There are not enough farms in the experiment to overcome this abnormality.

There is a great variety of crop and stock enterprises included in this district. Because of the climatic, market, soil, water, and transportation conditions, a wide selection of enterprises is offered these farmers. Each farmer of the area has his own set of conditions and he attempts to meet them to his best advantage. Consequently there is a great diversity of practices. Some farmers sell market milk in Salt Lake City. Some ship milk to creameries, some ship to cheese factories, and a few make butter on the farm and sell it at retail. Some farmers raise hay for the Salt Lake City market while others raise it to feed their own stock and even buy hay and grain in addition. The surplus poultry and eggs are sold to laborers of the smelters, or to private parcel post customers in Salt Lake City, or to a store at Sandy, Draper, or elsewhere.

The average capital investment on 72 farms in 1914 was $15,828, or greater than for any other area in this study in spite of the fact that there were only 100 acres per farm or fewer than for any area here investigated. The two main sources of income on these 72 farms were grain $301, and "other livestock" (sheep, hogs, poultry, and bees), $272. There was only one source of income which was equal to 10 per cent of the gross farm receipts and that was grain. There was an average of 7.8 crops grown per farm and 5.8 sources of income per farm. But in spite of sales of fruits, vegetables, sugar-beets, potatoes, grain, hay, straw, dairy products, cattle, horses, sheep and wool, hogs, poultry and eggs, honey, miscellaneous receipts, and increase in feed and supply inventory; yet the average labor income was a minus $102. Ten farmers had an average labor income of $592 the same year. There are two main reasons why these farms do not yield as large a labor income as the Hyde Park farms. While these farms have an excellent climate they have not quite as good soil as shown by the crop yields. The second reason is that land values on some of these farms are not based solely on their present agricultural productiveness but partake of the nature of real estate speculations and as such include a possible future agricultural value and also a possible future value as city lots for residences. A third possible reason is that because of this speculative feature and also because the speculators are attempting to farm the land themselves, the farmers, as farmers, are inferior to those at Hyde Park. There is no

(1)The Small Farm Families had from 1 to 4.9 members, the Medium Farm Families had from 5 to 7.9 members, and the Large Farm Families included those from 8 to 14 persons each.

doubt, however, that if one could get the actual increase in the value of land from year to year and add it to labor income one would find that these farmers were doing very well by holding the land for the rise in value and that the total farm profits are normal.. (See Tables XIII to XVII in Appendix.)

FERRON, EMERY COUNTY, UTAH

In 1910 Ferron had a population of 651.
The elevation is 5500 feet above mean sea level.

Table IL.—Tenure and Use of Farm Land per Farm, 38 Farms, Ferron, Emery County, Utah, 1914

Item	Farms Reporting	Average Acres(1) 38 Farms	Average Acres(1) Farms Reporting
Farm Area	38	106	106
Owned by Operator	37	81	83
Cash-rented Land	5	5	39
Share-rented Land	8	17	80
Crops	38	51	51
Pasture (woods)	1	0	4
Pasture (tillable)	20	9	17
Pasture (not ")	16	11	25
Fallow	10	3	12
Farmstead & Waste	37	21	22
Uncultivated	8	11	51
Irrigated Crops	38	52	—
Corn	18	1	2
Potatoes	27	1	1
Spring Wheat	35	9	10
Winter Wheat	1	0	2
Barley	13	1	2
Oats	36	9	9
Hay	11	6	20
Wild Hay	8	2	12
Alfalfa	32	19	22
Beets	1	0	0
Beans	2	0	7
Carrots	3	0	0
Mangels	7	0	1
Apples, Bearing	20	2	3
Seed Crops	12	1	4
Garden	7	0	1
Peaches	1	0	2
Berries	1	0	0
Cherries	1	0	0
Mixed Orchard	9	1	3
Squash	1	0	0

The normal annual precipitation is 9 inches, 5 of which fall in the growing season. The precipitation has varied from 3 to 13 inches annually. There are on the average only 37 days annually with 0.01 inch of precipitation. It is necessary to irrigate all crops in this area.

Ranges are poor because of this low precipitation. The mean annual temperature is 46.1° F. There are only 107 days in the average growing season, June 2 to September 17.

(1) Areas are given to the nearest acre.

The soil is not so good here as in the Hyde Park area. Ferron is in the Rocky Mountain Valleys, Plateaus, and Plains Soil Province(1). (See Figure 15). This soil is fairly fertile, however, as shown by the crops produced. The soil and climate slightly handicap this area in comparison with Hyde Park. Market conditions are of first importance in determining the general type of farming here.

Table IL shows the tenure and use of land at Ferron in 1914. The important crops are feed crops.

Ferron is about 45 miles from Price, the railroad town where some of the farm and range products from this district are marketed or loaded for shipment to market. Range cattle are the chief source of income. Some cattle are grazed on the Manti National Forest but most of them are grazed on the prairies or plateaus south, east, and west of Ferron. These range cattle are fed in winter and raising feed is an important part of the farming operations in summer. The available winter range has too severe a climate for cattle and sheep so they must be fed all winter. Some farmers let the cattle stay out so long that severe storms often cause great losses from cold and starvation. A few farmers have been fairly successful with bees.

Table L.—Size of Farm Family and Number of Milk and Beef Cows Kept, Ferron, Emery County, Utah, 1914

Size of Farm Family(2)	Number of Farms in Group	Average Number of Persons per Family	Average Age of Farm Operator (years)	Average persons over 16 Years Old on Farm	Number of Farms With Milk and Beef Cows	Average Number of Cows per Farm
All Farms	40	5.8	47.7	3.2	38	7.4
Small	14	2.9	45.2	2.4	14	6.3
Medium	12	5.7	49.4	3.0	10	10.1
Large	14	8.8	48.9	4.2	14	6.5

Fruits, such as apples, plums, and small bush fruits; vegetables; and melons are the main cash crops grown here. They are marketed at Sunnyside, Hiawatha, Scofield, and other mining camps that are from 40 to 60 miles distant and also at the stores in Ferron. Peddlers gather vegetables, fruits, farm butter, and meat from the farmers and sell them in the camps. Several farmers from whom business records were obtained had peddled during many summers. This peddling was the most important single item included in their miscellaneous receipts.

Hay and grain are also sold to some extent. Hay is usually baled and hauled to the camps or fed to a neighbor's cattle or sheep. Sugar-beets cannot be grown extensively because there is no sugar factory near. Dairying is limited because of a lack of market for dairy products. Not much care is given fruit trees because of the uncertainty of market and weather. A market as narrow as this cannot be satisfactory.

The type of farming followed seems, in general, well adapted to the conditions. The average labor income in 1914 was $117 and the aver-

(1) Whitney, Milton, U. S. D. A., Bu. of Soils, Bul. No. 55, (1909), gives a detailed description of these soils.

(2) The Small Farm Families had from 2 to 4.9 members, the Medium Farm Families had from 5 to 7.9 members, and the Large Farm Families included those having from 8 to 12 persons each.

age for the 10 better-paying farms was $785. The average of all farms in 1915 was $119, and in 1916 it was $412. (See Tables XVIII to XXII in Appendix).

Table L shows that there were 5.8 persons per family on the farms at Ferron, and that the average age of the farm operators was 47.7 years. This table does not show a very decided correlation between the size of the farm family and the average number of cows per farm. This may be due to the fact that there are not enough farms in each group as given in the table to establish a normal for each group. It is undoubtedly affected by the fact that many of the cows listed as milk cows are nothing more than range cows, which have been milked for only short periods.

WELLINGTON, CARBON COUNTY, UTAH

Wellington had a population of 358 in 1910, and is situated about 12 miles southeast of Price on the Denver and Rio Grande Railroad. The elevation is 5540 feet above mean sea level. The precipitation is only 7 inches, of which but 4 inches fall from April 1 to September 30.

Table LI.—Tenure and Use of Farm Land per Farm, 26 Farms, Wellington, Carbon County, Utah, 1914

Item	Farms Reporting	Average Acres(1) 26 Farms	Average Acres(1) Farms Reporting
Farm Area	26	117	117
Owned by Operator	25	92	96
Cash-rented Land	3	24	212
Share-rented Land	1	1	20
Crops	26	50	50
Pasture (woods)	1	4	100
Pasture (Tillable)	7	2	8
Pasture (not ")	4	2	16
Summer Fallow	7	4	15
Farmstead & Waste	26	29	29
Uncultivated	10	30	77
Irrigated Land	26	49	—
Corn	16	2	3
Potatoes	24	3	3
Spring Wheat	13	2	4
Winter Wheat	1	0	2
Barley	10	2	4
Oats	17	5	8
Hay	10	5	14
Alfalfa	22	29	34
Beets	2	0	1
Mangels	5	0	0
Seed Crops	2	1	12
Tomatoes	1	0	1
Beans	3	0	0
Cabbage	8	0	1
Apples, Bearing	6	0	1
Garden	10	0	1
Turnips	1	0	1
Berries	3	0	0
Mixed Orchard	2	0	0

(1) Areas are given to the nearest acre.

The soil is not so good here as in the Hyde Park area. Ferron is in the Rocky Mountain Valleys, Plateaus, and Plains Soil Province(1). (See Figure 15). This soil is fairly fertile, however, as shown by the crops produced. The soil and climate slightly handicap this area in comparison with Hyde Park. Market conditions are of first importance in determining the general type of farming here.

Table IL shows the tenure and use of land at Ferron in 1914. The important crops are feed crops.

Ferron is about 45 miles from Price, the railroad town where some of the farm and range products from this district are marketed or loaded for shipment to market. Range cattle are the chief source of income. Some cattle are grazed on the Manti National Forest but most of them are grazed on the prairies or plateaus south, east, and west of Ferron. These range cattle are fed in winter and raising feed is an important part of the farming operations in summer. The available winter range has too severe a climate for cattle and sheep so they must be fed all winter. Some farmers let the cattle stay out so long that severe storms often cause great losses from cold and starvation. A few farmers have been fairly successful with bees.

Table L.—Size of Farm Family and Number of Milk and Beef Cows Kept, Ferron, Emery County, Utah, 1914

Size of Farm Family(2)	Number of Farms in Group	Average Number of Persons per Family	Average Age of Farm Operator (years)	Average persons over 16 Years Old on Farm	Number of Farms With Milk and Beef Cows	Average Number of Cows per Farm
All Farms	40	5.8	47.7	3.2	38	7.4
Small	14	2.9	45.2	2.4	14	6.3
Medium	12	5.7	49.4	3.0	10	10.1
Large	14	8.8	48.9	4.2	14	6.5

Fruits, such as apples, plums, and small bush fruits; vegetables; and melons are the main cash crops grown here. They are marketed at Sunnyside, Hiawatha, Scofield, and other mining camps that are from 40 to 60 miles distant and also at the stores in Ferron. Peddlers gather vegetables, fruits, farm butter, and meat from the farmers and sell them in the camps. Several farmers from whom business records were obtained had peddled during many summers. This peddling was the most important single item included in their miscellaneous receipts.

Hay and grain are also sold to some extent. Hay is usually baled and hauled to the camps or fed to a neighbor's cattle or sheep. Sugar-beets cannot be grown extensively because there is no sugar factory near. Dairying is limited because of a lack of market for dairy products. Not much care is given fruit trees because of the uncertainty of market and weather. A market as narrow as this cannot be satisfactory.

The type of farming followed seems, in general, well adapted to the conditions. The average labor income in 1914 was $117 and the aver-

(1) Whitney, Milton, U. S. D. A., Bu. of Soils, Bul. No. 55, (1909), gives a detailed description of these soils.

(2) The Small Farm Families had from 2 to 4.9 members, the Medium Farm Families had from 5 to 7.9 members, and the Large Farm Families included those having from 8 to 12 persons each.

age for the 10 better-paying farms was $785. The average of all farms in 1915 was $119, and in 1916 it was $412. (See Tables XVIII to XXII in Appendix).

Table L shows that there were 5.8 persons per family on the farms at Ferron, and that the average age of the farm operators was 47.7 years. This table does not show a very decided correlation between the size of the farm family and the average number of cows per farm. This may be due to the fact that there are not enough farms in each group as given in the table to establish a normal for each group. It is undoubtedly affected by the fact that many of the cows listed as milk cows are nothing more than range cows, which have been milked for only short periods.

WELLINGTON, CARBON COUNTY, UTAH

Wellington had a population of 358 in 1910, and is situated about 12 miles southeast of Price on the Denver and Rio Grande Railroad. The elevation is 5540 feet above mean sea level. The precipitation is only 7 inches, of which but 4 inches fall from April 1 to September 30.

Table LI.—Tenure and Use of Farm Land per Farm, 26 Farms, Wellington, Carbon County, Utah, 1914

Item	Farms Reporting	Average Acres(1) 26 Farms	Average Acres(1) Farms Reporting
Farm Area	26	117	117
Owned by Operator	25	92	96
Cash-rented Land	3	24	212
Share-rented Land	1	1	20
Crops	26	50	50
Pasture (woods)	1	4	100
Pasture (Tillable)	7	2	8
Pasture (not ")	4	2	16
Summer Fallow	7	4	15
Farmstead & Waste	26	29	29
Uncultivated	10	30	77
Irrigated Land	26	49	—
Corn	16	2	3
Potatoes	24	3	3
Spring Wheat	13	2	4
Winter Wheat	1	0	2
Barley	10	2	4
Oats	17	5	8
Hay	10	5	14
Alfalfa	22	29	34
Beets	2	0	1
Mangels	5	0	0
Seed Crops	2	1	12
Tomatoes	1	0	1
Beans	3	0	0
Cabbage	8	0	1
Apples, Bearing	6	0	1
Garden	10	0	1
Turnips	1	0	1
Berries	3	0	0
Mixed Orchard	2	0	0

(1) Areas are given to the nearest acre.

At the time these records were taken there was no sugar factory in this district; therefore no sugar-beets were grown. Dairying was limited because of market conditions, the great distance to haul cream, etc. Some farmers milk a few cows and the farm families make butter which is sold at the town stores or traded there for groceries. Some poultry and eggs are also traded for groceries.

Table LIV shows the tenure and use of farm land at Hinckley. The main sources of income on the average are (1) alfalfa seed, (2) alfalfa hay and other hay, and (3) cattle. The average receipts from each of these respectively were in 1914, alfalfa seed $340, hay $244, and cattle $186. The growing of alfalfa seed on most of the farms of this area is quite a gamble. On a few farms a fairly good crop is obtained each year. When a crop of seed is obtained the farmer makes a very good labor income but when the crop is left for seed and the seed fails little use can be made of it and labor income in such cases is sometimes a minus quantity. Some grain is sold and a few surplus potatoes are raised in normal years. In short, Hinckley is a distinct and separate community of farmers. The area feeds itself but its clothes, household-goods, and other necessaries it must purchase outside of the community. It pays for these purchases largely with alfalfa seed, hay, cattle, farm butter, surplus eggs, farm dressed pork, a few horses, and personal services.

The type of farming followed is fairly well adapted to the conditions and is moderately profitable. The average labor income of 59 farmers in 1914 was $323. The same year there were ten farmers who had an average labor income of $1403. The average labor income in 1915 was $104, and in 1916 it was $468. (See Figures 1 to 21 in the Text, and Tables XXIII to XXVII in Appendix).

PLEASANT GROVE, UTAH COUNTY, UTAH

Pleasant Grove had a population of 1618 in 1910.

The elevation is 4532 feet above mean sea level.

The normal annual precipitation is 15 inches(1), 6 of which fall in the growing season. The absolute lowest annual precipitation recorded is 9 inches and the absolute highest precipitation recorded is 22 inches. There are on the average 66 days annually with 0.01 inch or more precipitation. Dry-farming is successfully practiced here. The principle dry-farm crops are wheat and alfalfa. The mean annual temperature is 49.7° F. This is higher than for Hyde Park but lower than for Sandy. The warmest temperature recorded in any of the 8 areas is 105° F. and that was recorded for this area. The avergae crop-growing season has 145 days, or a few less than Hyde Park and 35 to 40 less than Sandy, although situated further south than either of these districts. The average date of last killing frost in spring is May 12, or about the same as for Hyde Park but a little earlier than Beaver and much later than Sandy. The absolute latest date of killing frost in spring is June 29, or about the same as at Hyde Park and Monroe. The climate here is affected by Utah Lake.

This area is situated in the Great Interior-basin Soil Province. A detailed soil survey has been made of the area(2). The following soil types are distinguished: Maricopa stony loam, Caricopa gravelly loam, Jordan clay, Fresno sand, Jordan loam, Jordan sandy loam, Salt Lake loam, and

(1)There is no U. S. Weather Bureau Station at Pleasant Grove. The information given here is recorded for Provo which is the station having a climate very similar to Pleasant Grove and is situated in the township just south of the Pleasant Grove township.

(2)Sanchez, Alfred M., U. S. D. A., Bu. of Soils, Field Operations. (1903).

the gravel areas. These same soil types, except one, are found in Salt Lake county and are among those identified in the Sandy area. The best sugar-beet soil is the Jordan sandy loam, and the Jordan loam is the second best soil for this crop.

Most of the irrigation water is taken out of American Fork Creek but it is inadequate to irrigate the land of the area. Considerable land west of Pleasant Grove is irrigated by flowing wells. A small creek enters the valley east of Pleasant Grove, and furnishes irrigation water for some of the farms of this area.

The railroad transportation facilities are good. The San Pedro, Los Angeles, and Salt Lake Railroad and the Rio Grande Western traverse the area from north to south. The electric interurban road from Preston, Idaho, thru Logan, Brigham City, Ogden and Salt Lake City, runs thru Pleasant Grove to Provo. There are good auto roads running north, east, south, and west from the town. Sugar-beets are shipped from here to the Lehi factory.

The Wasatch National Forest to the east of town offers splendid grazing for cattle and sheep for about 8 months during the year. More cattle than sheep were kept on this range during the past few years because they have been more profitable(1). In many respects the conditions here are similar to those at Hyde Park.

Table LV.—Size of Family, Acres of Sugar-beets Raised, and Cows Milked, Pleasant Grove, Utah County, Utah, 1916

Size of Farm Family(2)	Number of Farms in Group	Average Number Persons per Family	Average Age of Farm Operator (years)	Number of Farms Raising Beets	Average Acres Beets per Farm	Number of Farms With Milk Cows	Average Number Cows per Farm
All Farms.....	56	5.8	43.3	41	6.2	55	4.8
Small	13	3.0	44.0	10	6	13	6
Medium	26	4.7	43.0	19	5	25	4
Large	17	8.4	43.0	13	8	17	6

Table LV does not show a very striking direct correlation between size of farm family, acres of sugar-beets per farm, and number of cows per farm. This may in part be due to the new farms included in the small and large family groups, also to the lack of carefully distinguishing between the milk and range cows.

Table LVI shows the tenure and use of land in the Pleasant Grove area.

Table XXVIII in the appendix shows that the land on the average farm was valued at $5,019, the buildings $1,235, livestock $892, machinery $350, and feed and supplies $296, making a total capital per farm of $7,792. The sources of income in the order of importance were in 1916,

(1)Third Annual Report, Utah State Bu. of Immigration, Labor and Statistics, 1917, p. 185.

(2)The Small Farm Families had from 1 to 4.9 members, the Medium Farm Families had from 5 to 6.9 members, and the Large Farm Families included those having from 7 to 12 persons each.

Table LVI.—Tenure and Use of Farm Land per Farm, 56 Farms, Pleasant Grove, Utah County, Utah, 1916

Item	Farms Reporting	Average Acres(1) 56 Farms	Average Acres(1) Farms Reporting
Farm Area	56	68	68
Owned by Operator	56	54	54
Cash-rented Land	11	6	31
Share-rented Land	15	8	28
Crop Area	56	35	38
Pasture (woods)	11	13	65
Pasture (Perm. till.)	23	4	11
Pasture (not ")	13	3	13
Summer Fallow	7	3	19
Farmstead & Waste	53	4	4
Uncultivated	5	4	40
Dry-farm Land	28	6	—
Winter Wheat	14	2	9
Barley	17	1	3
Summer Fallow	7	3	19
Irrigated Crop Land	56	33	—
Beans	6	0	1
Corn	32	2	3
Potatoes	48	1	1
Spring Wheat	44	4	5
Oats	41	3	4
Hay	30	5	10
Alfalfa	48	10	12
Seed Crops	2	0	2
Beets	43	5	6
Garden	9	0	0
Apples, Bearing	35	1	2
Apples, not Bearing	9	1	8
Mixed Orchard	33	1	2
Berries	17	0	1
Peas	5	0	1

sugar-beets $298, Cattle sales $186, miscellaneous receipts $178, dairy products $170, grain $141, potatoes $133, fruit $126, increase in feed and supply inventory $87, swine sales $82, poultry and eggs $57, increase in livestock inventory $56, hay $41, horse sales $36, increase in machinery inventory $24, other crop sales $18, increase in inventory of land and buildings $13, and sheep sales $2, a total of $1,649 from 17 sources. The farm expenses amounted to $608 and labor income $418. There have been a number of publications dealing with the type of farming in this valley. four of these deal with the Provo Area only, but much of the information is applicable to Pleasant Grove(2). (See Table XXVIII in Appendix).

(1)Areas are given to the nearest acre.

(2)Thompson, E. H., and Dixon, H. M., U. S. D. A., B. P. I. Bul. No. 117, (July, 1914); Connor, L. G., U. S. D. A. Farm Mgt. Bul. No. 582, (Jan., 1918); Connor, L. G., Utah Agr. Exp. Sta. Bul. No. 165, (Oct., 1918); Moorhouse, L. A. and Others, U. S. D. A. Farm Mgt. Bul. No. 693, (July,1918).

GENERAL SUMMARY

1. Type of farming as here used means kind or example of farming.

2. The ideal type of farming for any community at any one time is that which combines crops, livestock, machinery, buildings, land, water, labor, and management of such kinds and grades, and in such amounts, numbers and proportions, and in such ways as to yield the highest long-time average net returns per unit of management or per manager.

3. Types of farming compete with each other on farms as do also individual crop and stock enterprises and the experiences of farmers tend to establish that type which is best suited to each farm and each district.

4. It is difficult in many cases to change readily from one type of farming to another.

5. The type of farming most profitable in a community this year may not be the best a few years from now because of varying economic conditions.

6. It is in the inter-relations of all the factors both natural and economic that the type of farming for any community or any particular farm is determined and as a rule that found in any community which has been settled for 50 years or more is not far from what it should be.

7. The purpose of this investigation is to show some of the inter-relations of the natural and economic factors as they affect some types of farming in Utah.

8. The original data here presented were collected by the writer and assistants during the years 1914, 1915, and 1916, when he was in the employ of the United States Department of Agriculture and the Utah Agricultural College.

9. The Survey Method was used in collecting these data.

10. A study of type of farming has the following phases:

(1) Enumeration and description of the individual crop and stock enterprises.
(2) Determination of the magnitude and importance of each separate enterprise.
(3) Determination of the combinations of the enterprises.
(4) Determination of the proportions in which the enterprises are combined.
(5) Analysis of the factors affecting the choice of the enterprises and their combinations.

HYDE PARK, CACHE COUNTY, UTAH

11. Hyde Park is in Cache Valley in Cache County in the north-central part of Utah.

12. The elevation at Hyde Park is about 4,507 feet above mean sea level.

13. Hay is the principal feed crop of the area and is used for dairy cows, young stock, and work horses. On the average farm of the area there are 13 acres of alfalfa and only 7 acres of other hay. Oats are also grown for feed. Sugar-beets, dry-farm wheat, and barley are the cash crops. Potatoes are grown for farm-home use and to supply the local market. There was not much change in type of farming during the three years of this investigation. The wet low-lands are pastured or are in meadow. Some of the foothills are also pastured. Thus climate, irrigation, and drainage have determined location and extent of pasture.

14. It is largely on account of the pasture conditions at Hyde Park that dairying is so important in this district.

15. Wheat is a more profitable dry-farm crop than barley at Hyde Park.

16. The reasons why alfalfa is grown on land suited for sugar-beets are:

(a) Alfalfa is needed for livestock feed.
(b) Alfalfa gives a better labor distribution.
(c) Alfalfa makes it possible to do some productive work in winter.
(d) It saves paying out an excessive amount of wages for hired help in summer.
(e) Alfalfa is needed in the crop rotation.
(f) The combination consequently nets a greater annual income.

17. Oats and spring wheat are both grown for the following reasons:

(a) Oats are grown mainly for horse feed.
(b) Spring wheat is grown on irrigated land as a cash crop.
(c) Growing both gives a better labor distribution.
(d) Alternating the two gives higher yields.
(e) Wheat on alfalfa sod before sugar-beets allows alfalfa roots and crowns to decompose to a greater extent, which facilitates beet culture the following year.
(f) Growing both saves labor or uses it more productively, gives better crop yields, helps in the culture of beets, and consequently increases the net annual income.

18. The reasons why 9 to 10 acres of beets are grown and less than 1 acre of potatoes on the average Hyde Park farm are as follows:

(a) These two crops compete for land, labor, capital, and management.
(b) Ten or 11 acres of these intensive crops are about all the average farm family can handle conveniently.
(c) A greater use of unpaid family labor may be utilized to advantage on the sugar-beet crop and the acres raised varies directly as the number in the farm family on the farm.
(d) The soil at Hyde Park is better adapted to beets than to potatoes.
(e) The potato market is practically limited to the local demand, while sugar, the final product of beets, competes on the world markets.
(f) The sugar factory companies contract in advance of planting time to pay the farmers a definite price per ton for the beets, which certainty of price takes much risk from the farmer and makes farming more stable.
(g) Potatoes are grown only for home use and the local market and 1 acre is sufficient to supply this demand.
(h) It is because of the above conditions that some beets and potatoes are grown at Hyde Park.
(i) Because of these conditions beets are on the average more profitable, and nine or ten times as many acres are devoted to the crop as are devoted to potatoes.

19. The number of Productive Animal Units seems to be increasing on the Hyde Park farms.

20. Heifers are raised to replace the dairy cows and because of cheap feed and otherwise low cost of production a few are sold as cows or heifers.

21. On the average there were about 7.4 units of dairy cows kept per farm. No more are kept because of the limited pasture, and also because the farm family usually does all the milking and the size of the herds varies as the number in the farm family. The larger families milk the most cows. However, these farmers are not milking as many cows as they might with as large families as they have.

22. Some range cattle are kept because of the availability of some

range land for grazing purposes on the Cache National Forest Reserve and because the milk cows cannot use the ranges to advantage.

23. Colts are raised both for work and for sale. Relatively cheap feed makes it possible to raise colts to sell.

24. On the average there is one work horse to 14 or 15 acres of crops. The better paying farms on the average have one work horse to each 15 to 19 acres of crops. This is not an especially efficient use of work horses but is undoubtedly due in part to the brood mares, the rather intensive crops grown, and the lack of usable machinery for many of the operations on the sugar-beet crop.

25. A cow pony is kept to use in driving the cows to and from pasture.

26. On all farms a total of 46 sheep including lambs are kept as scavengers. This is less than an average of 1 sheep per farm.

27. Hogs are raised for home use mainly. One reason why more are not raised is because all the farm homes and buildings are in town and a herd of hogs would be very undesirable under these conditions.

28. Hens are kept mainly to supply the farm homes with eggs and meat. More poultry in town where homes are close together would be a nuisance.

29. Hogs and hens are fed largely on table scraps, grain screenings, skim milk, and other waste-feeds. Bran and shorts are sometimes fed to hogs for a short period before butchering. These conditions tend to make cheap meat and eggs for family use.

30. There are three features of special significance in this area.

(a) Most of the land is irrigated and most of the farmers raise sugar-beets on a part of this irrigated land and milk a few cows. Water for the extension of irrigation is limited. Suitable pasture for milk cows is limited. The sugar-beet area and the number of cows milked vary directly with the number of persons in the farm family.

(b) Dry-farming is practised as a means of extending or increasing the size of the farm business. Even the dry-farm land has been taken up by the local farmers and is no longer available to entry.

(c) Grazing on the Cache National Forest offers some good opportunities to a few farmers, but even these advantages are absorbed by a few men and the ranges are stocked to their capacity.

31. Sugar-beets and wheat are raised instead of raising more pasture, barley, oats, and alfalfa as feed for livestock because:—

(a) Raising cash crops utilizes the available summer labor to good advantage.

(b) The sugar-beet crop especially makes labor for school children.

(c) The combination of livestock and these cash crops makes a more diversified and better balanced farm business and therefore a safer and more desirable business for the average farmer than the more specialized livestock farming.

(d) The combination is on the average more profitable than the specialization.

32. The balance of the farm business is fair. No regular system of crop rotations is practised. The cultivated crops receive about 6 tons of manure per acre per year, or 30 tons every 5 years. With the abundance of minerals in the virgin soil the fertility has been maintained and even increased in some cases. About 40 to 45 per cent of the farm receipts are from crops, 30 to 40 per cent from stock and stock products, 16 per cent from increase in inventory, and 9 per cent from miscellaneous sources

such as outside labor. On the average there were 3.6 crop acres per productive animal unit. This ratio furnishes ample feed for stock and allows growing cash crops as well.

33. The 52 farms, in 1914, had an average farm capital of $13,642; farm receipts, $2,510; farm area, 105 acres; crop acres, 54; acres sugar-beets, 8.5; productive animal units, 14.8; milk cows, 7.5; work horses, 4; and man labor equivalent, 1.6. One of the main reasons for the few acres is found in the small farms originally taken up by squatters in 1859. Another reason is the difficulty of overcoming the obstacles to increasing the number of acres.

34. The modern farm machinery is in general use on these farms. The average value of machinery per farm is about $420, or $5 to $9 per crop acre. The larger farms have more farm machinery, but the machinery cost is less per acre than on the smaller farms. It is likely that when a sugar-beet thinner and a sugar-beet topper are perfected that the acreage of these crops may be greatly increased.

35. The type of farming followed and the size of the farm business largely determine the kind and size of farm buildings required. At Hyde Park the buildings are fairly well adapted to the needs. It has happened at Hyde Park that because of insufficient storage space, grain and potatoes have of necessity been sold in the fall at harvest time, when if storage space had been available they would have been held until winter or spring.

36. The average value of dwelling house in 1914 was $1335. The larger farms have better dwellings and better barns than the smaller farms and yet the shelter cost per animal unit is less on the larger farms than on the smaller farms.

37. Climate is the most important single factor in determining the type of farming in all parts of Utah. It determines whether irrigation is necessary, whether dry-farming will be successful, and that the desert shall remain a desert.

38. There are 151 days in the crop-growing season at Hyde Park; 16 inches is the mean annual precipitation; 7 inches fall annually between April 1 and September 30; the mean annual temperature is 47.6° F., with a mean difference between night and day of 21.9° F.; the mean humidity during the day is about 50 per cent; and the annual rate of evaporation from a free-water surface is about 45 to 55 inches.

39. Topography is an important factor in determining the type of farming in Utah in general, and on individual farms. It is estimated that 40 per cent of the area of Utah will never be cultivated on account of the mountains. These mountains furnish grazing for livestock, and in Hyde Park and many other areas affect greatly the type of farming.

40. The Cache County farm soils are in the Bonneville beds and vary from gravel, small gravel, and light sand thru all grades to the heaviest and most tenacious clays. The varying soil types make it possible to diversify the farm business at Hyde Park even more than would a single soil type of good quality.

41. The control of grazing on the National Forests by government officials has (1) eliminated to a certain extent free competition in the use of grazing lands, (2) established a privileged class of farmers, and (3) largely determined the type of farming on many farms adjacent to the National Forests.

42. The carrying capacity of the Cache National Forest is estimated at 17 acres per animal unit, and it is at present stocked to its carrying capacity. The average grazing season on this Reserve is 5 to 8 months. The grazing on National Forests affects greatly the number of animal units kept by farmers. The better the grazing facilities the greater the number of animal units kept.

43. Persons are better able to do that type of farming with which they

are familiar. The origin and training of the farm population are therefore important in studying types of farming. Most of the parents of the native-born white persons of foreign parentage at Hyde Park and also most of the foreign-born whites came from Great Britain and the countries of northwestern Europe. The type of farming at Hyde Park is similar in many respects to that of these foreign countries.

44. Hyde Park farms are family-sized farms. One manager is all that is required on any of them and he does most of the farm work.

45. The average number of persons in the farm families included in this area was 7.4, but only 6 of these persons made their home on the farm. The Hyde Park farm families are larger than the average Cache County farm family. The average farm family in Cache County is larger than the average for the State and the average for the State is greater than for the United States.

46. The size of farm family has a definite relationship to the type of farming practised as is suggested by the fact that on those farms with large families more acres of sugar-beets are raised and more milk cows are kept than on the farms with medium or small farm families. The total crop acres are also greater on the farms with large families.

47. The family income is greater on the farms with large families than on the farms with medium-sized or small families.

48. These facts indicate that the entire farm family is the basic unit around which the farm business is organized.

49. There is great variation in the value of the farm home.

50. There is, however, no correlation between the value of the farm home and labor income or farm income.

51. Not only family labor but also hired labor affects type of farming. The possibility of hiring school children for beets affects greatly the acreage grown at Hyde Park.

52. At Hyde Park the total man labor equivalent for the average farm was 1.6. This is equivalent to 1 man, the operator, twelve months or 1 year, and 7 months, and 6 days of additional man labor. A large part of the additional labor was furnished by the farm family and the remainder hired. A considerable part of that hired was for beet work and hay and grain harvest.

53. Sugar-beets and potatoes conflict in labor time. This is one reason why potatoes are not grown more extensively here.

54. The crop acres per man at Hyde Park (33:1) is comparable with that of the acres of improved land per person ten years old and over gainfully engaged in agriculture in Utah, 1909 (37.4:1). At Hyde Park, however, persons 10 years old were not considered men nor was pasture counted as crop acres.

55. Utah is not advantageously situated with respect to world markets, and prices of exported products are therefore comparatively low and prices of imported products are relatively high.

56. Where the market cannot be adapted to the type of farming otherwise best for an area, the type of farming must be adapted to the market.

57. The development of dairying followed the establishment of the condensed milk factories, creameries, and cheese factories. The growing of sugar-beets followed the erection of the sugar factories. The establishment of packing plants at Salt Lake and Ogden have stimulated pork production. As a result of higher livestock prices, less free range, and better livestock, more care is being given livestock on the farms. Because land is being used for cultivated crops and also because more hay is used for livestock feed there is less hay being exported than formerly.

58. The fact that Hyde Park is 1½ miles east of the branch line station of the Oregon Short Line Railroad instead of nearer a main line station is a handicap in shipping to distant markets.

59. The Utah and Idaho Central, Electric Railway, runs thru the town limits and has facilitated greatly local shipments to Preston, Idaho; Logan, Brigham, Ogden, Salt Lake, and Provo, Utah; and intermediate points.

60. The State Highway passes thru the Hyde Park township. This facilitates milk hauling and the local transportation of other farm products.

61. There were no tenant farms at Hyde Park, but 23 of the 52 farmers investigated, rented additional land.

62. Share tenancy is more common than cash tenancy in Cache County as a whole, but at Hyde Park 18 out of the 23 farmers who rented additional land, paid cash rent for it. This fact indicates that the Hyde Park farmers on the average are more prosperous than the average Cache County farmer and also that the type of farming does not lend itself so readily to share renting.

63. Pasture land rented for from $2 to $3 per acre and cultivated crop land for from $7 to $21 per acre. The latter figure was paid for sugar-beet land. The average cash rent per acre was $9.13. The dry-farm wheat crop was divided, four-tenths to landlord and six-tenths to tenant. Hay and oats on irrigated land was rented for one-half share. On one patch of irrigated wheat the tenant got a little more than one-half, and on one patch of irrigated alfalfa the tenant received five-ninths of the crop.

64. The land is rented by these farmers to increase the size of the farm business and no doubt here, as elsewhere, renting is an intermediate step in the process of becoming owners of the land rented.

65. The small percentage of tenancy here is due to a number of circumstances and conditions. The main reasons are as follows:

(1) The country is new and it has been easy to become a farm owner without tenancy, by (a) homesteading, or (b) purchasing.
(2) The farms are comparatively small, and therefore the total capital necessary to purchase a farm is not so great as to be prohibitive to the moderately well-to-do.
(3) The type of farming followed is one which is conducive to ownership, is not attractive to tenants, and is not well adapted to tenant farming.
(4) The great increase in the value of the land has been a propelling influence toward land ownership. Tenancy in Utah, however, is gradually increasing.

66. Up to July 1, 1918, there had been only 8,572,842 acres, or 16.3 per cent, of all land in Utah entered for settlement. Of this area 3,397,699 acres were reported by the Thirteenth Census as land in farms.

67. The amendments to the Desert Land Laws and the passage of the Stock-raising Homesteads Acts have made it practicable to settle a considerable area of the remaining land of the State. These laws have therefore affected greatly the types of farming in the State.

68. Land values are largely determined by type of farming. The agricultural value of a piece of land is the capitalized agricultural income of that land with all future increases in its value discounted to-date; and the income of the land is obviously a result of the type of farming practised.

69. The individual farmer, on land of a given value, must, however, follow a type of farming on that land that is profitable or else he will fail.

70. Land values at Hyde Park are higher than the average state value.

71. As population increases or the relative prices of farm products rise, the land is more thoroly and intensively utilized and land values

become greater. As interest rates become less or the value of the dollar decreases land rises in value.

72. About two-thirds of the crop land at Hyde Park is irrigated and ne other one-third is dry-farm land. An extension of agriculture is limited by water and mountains or by climate and topography.

73. At Hyde Park, as is common in Utah, the farmers own and operate the canal systems furnishing irrigation water. Water-rights in canals were obtained in payment for services in constructing the canals or were bought from the original owners. The amount of water that each farmer gets each year is often very variable and uncertain but is usually sufficient to mature his crops. The annual cost per share of stock or per acre of land irrigated was about 50c in 1909.

74. A good irrigating stream for the average man under average conditions is from 2 to 5 second-feet.

75. Three to 5 acre-inches is enough for a good irrigation. Two and one-half acre-feet is the maximum needed in Utah in addition to the precipitation to produce a crop if it is applied at the proper season, May 1 to August 31.

76. One second-foot will irrigate 70 to 160 acres in the four months of the irrigation season.

77. The water-master has control over the distribution of water among the farmers and is therefore a factor in determining the type of farming.

78. The crops grown at Hyde Park do not as a rule require irrigation water at the same time and are therefore not competing crops in this respect. The nearest to competition is between potatoes and sugar-beets.

79. Lack of knowledge of the water requirements of plants, the duty of irrigation water, and the proper time to irrigate each crop may affect type of farming by showing one crop more profitable than another. Proper irrigation may prove the opposite crop to be more profitable. Much depends upon the knowledge of the irrigation farmer, the amount of water in the streams, and the division of the water by the water-master.

80. The type of farming followed depends to some extent upon the farmers' ability to get capital or money. Men at Hyde Park and elsewhere in Utah are not going into the livestock business as early as they would like because of insufficient funds, and yet these farms are not as heavily mortgaged as the average farm in Cache County, nor the average of the State of Utah, nor the average of the United States.

81. With the facilities at hand some of the Hyde Park farmers might, with safety, extend their farming operations by obtaining additional capital by mortgaging their farms. When the interest rate is 5½ per cent this practice would undoubtedly increase the average labor income of these farmers.

82. The average estimated total cost of farm loans on personal security in Utah, 1914, including interest, discounts, bonuses, commissions, and other extra charges was 10.4 per cent. For farmers who have to pay this high charge for the use of capital, to borrow in order to enlarge the general farm business is of doubtful practicability.

83. Farm profits are largely determined by the type of farming practised. The most profitable type of farming depends upon the conditions and circumstances of the individual farmer and farm.

84. Using 5 per cent as the interest rate the average labor income of the Hyde Park farmers in 1914 was $946; using 5½ per cent it was $878; using 8 per cent it was $537; using 8.6 per cent it was $455; and using 9 per cent it was $400. When interest is figured at 6 per cent labor income and the interest on investment are about equal.

85. Labor income does not include as a receipt that part of the family living obtained from the farm nor the increase in the value of the land. When these two items are included as receipts and interest is calculated at 8 per cent, the average labor income of these farmers is about $1300, of

which $600 is the opportunity value of the farmer's labor and about $700 is pay for management which cannot be delegated and risk or responsibility taken.

86. The labor incomes of the farmers of this area are better than the average of the State and perhaps some better than the average of the United States. The business is about the same each year, and tho there are always a few who make very little, if anything, the profits of the majority are normal.

87. The variations in labor income from year to year on an individual farm result from the various causes that affect farm profits on different farms, because each year, in a measure, presents an entirely new set or combination of conditions which the farmer has to meet, and over many of these he has no control whatever.

88. The landlords who rented out their land have received on the average between 6 and 7 per cent net returns on their investment. With land increasing in value about $2.50 per acre annually, owning Hyde Park farm land has been profitable.

89. Even if interest rates were considerably higher than 8 per cent, men would buy farm land in preference to loaning their money on farm mortgages because of this increase in land value and the rent they are able to get from its use in farming.

90. While the average labor income of the farmers of Utah in 1910 was not quite as high as that for the average of the United States, this was due to a higher rate of interest being charged in Utah and is offset by the increase in land values.

BEAVER, BEAVER COUNTY, UTAH

91. Beaver is situated about 300 miles south of Hyde Park.

92. The elevation at Beaver is 6,000 feet above mean sea level or 1,500 feet higher than Hyde Park.

93. Dry-farming was not practised at Beaver due to lack of sufficient precipitation during the growing season and to soil conditions.

94. Alfalfa was the principal crop grown. Over 75 per cent of the total area in crops was in alfalfa and other hay. The hay is grown largely for feed for livestock.

95. Livestock and stock products are the principal sources of income from these farms. Some hay, grain, potatoes, and fruit are sold to local markets.

96. The average expense for all labor other than that of the farm operator on the ten better-paying farms was about $696.

97. The better paying farms had a larger business and their livestock was more productive in proportion to feed fed than the average farm.

98. Man and horse labor were both more efficient on the better-paying farms than on the average farm.

99. The farm business at Beaver is fairly diversified.

100. Cattle, sheep, dairying, and raising feed, in addition to raising a surplus of hay, grain, and potatoes as cash crops, make a fairly well balanced business.

101. During the winter months, however, farmers' sons spend too much time in town playing pool, etc., instead of on the farms at productive farm labor.

102. The type of farming at Beaver is more extensive, or not so intensive, as that at Hyde Park.

103. The value of farm machinery per farm is greater at Beaver than at Hyde Park due to the kind of farming and the larger areas farmed by machinery.

104. The value of farm buildings is less at Beaver than at Hyde Park due in part to warmer climate, more recent settlement, and fewer dairy cows.

105. The annual precipitation is about 13 inches at Beaver. All crops were irrigated in 1914.

106. The soils, as at Hyde Park, are of all grades from coarse gravels to heavy clays depending upon nearness to the valley bottom and distance from the mouth of the canyon. This area is also in the Great Interior Soil Province.

107. As at Hyde Park, there is also some bottom land needing drainage and some land above the canals which, if irrigated, would be very productive.

108. The Fillmore National Forest affords summer grazing for cattle and sheep and the Millard Desert is used for winter sheep range. These ranges will need to be handled more carefully in the future than in the past, or they will not even maintain their present carrying capacity.

109. The population of Beaver was 1,899 in 1910. A large proportion of those who were born in the United States came from Utah and other Western and Middle Western States to Beaver. The foreign-born population is largely from Northwestern Europe and Great Britain. They are therefore familiar with livestock and general farming methods.

110. The average number in the farm families on the farms at Beaver in 1914 was 5.4 persons. Two of these were less than 16 years old and 3.4 were over 16 years old. These farm families are not as large as at Hyde Park.

111. The average number of men employed per farm was 1.4. That is equivalent to the operators' full time and 0.4 of a year of other man labor performed either by other members of the farm family or by hired help. This is two and one-half months of man labor less than was utilized at Hyde Park.

112. In this area as at Hyde Park there is direct correlation between the size of farm family and number of cows kept for breeding and milk.

113. Man and horse labor seems to be fairly efficient. In 1914 there were on the average 46 productive animal units per man and 46 crop acres per man. There were 16 crop acres per work horse.

114. Beaver City is 32 miles from Milford, the nearest railway station, but the dirt road is in good condition most of the year.

115. Milford is 206 miles west of south from Salt Lake City on the Salt Lake-Los Angeles Railroad. Salt Lake is about 100 miles south of Hyde Park.

116. It is therefore about 300 miles east of north from Beaver to Hyde Park. In spite of this fact there are about 25 more days in the average crop-growing season at Hyde Park than at Beaver. This is due mainly to the greater altitude, less favorable exposure, and poorer air drainage at Beaver.

117. The main auto highway between Salt Lake City and Los Angeles, The Arrowhead Trail, passes thru Beaver.

118. Due to these market conditions the greater part of the farm products are marketed or fed on the farm.

119. Livestock are driven to the railroad and shipped to Los Angeles, Salt Lake, Ogden, Kansas City, Omaha, or Chicago.

120. Most of the eggs and farm-made butter are sold to general merchandise stores at Beaver and are taken by them in auto trucks to Milford for shipment to Salt Lake and elsewhere. Some eggs and butter are sold in the mining camps near Beaver. Some cream is sold in Beaver and some in the camps. The few surplus potatoes are shipped via Milford.

121. The distance from the individual farms to the Beaver Postoffice varies from ⅛ to 4 miles, so that none of them are a great distance from the local market.

122. There is very little tenancy in Beaver. As at Hyde Park, some farmers rent additional land in order to enlarge their farm business. At Beaver City more land was rented for cash than for share, but the Thir-

teenth United States Census shows more share than cash tenants for Beaver County.

123. The average value of land and buildings per acre at Beaver in 1915 was $43. The value at Hyde Park was two and one-half times this amount. The lower price of land and the more extensive farming go together. The high value of land is a result of the greater profitableness of the more intensive type of farming. Farmers cannot afford to do extensive farming on high-priced land because the greater value of the land is determined largely by the more profitable and more intensive type of farming.

124. The facts given concerning water-tenure, water-rights, canal ownership and operation, duty of water, and irrigation practices at Hyde Park apply also to Beaver.

125. Only 7 out of 50 farmers reported that their farms were mortgaged. The interest rates paid varied from 5 to 9 per cent and averaged 7.14 per cent.

126. Using 7.14 per cent as the interest rate that farm capital should and could earn, the average labor income of 50 Beaver farmers in 1914 was $92. Using 5 per cent, labor income was $396. Using 9 per cent as the interest rate, labor income was minus $170.

127. The labor income was greater in 1915 than in 1914 and greater in 1916 than in 1915. This was due largely to the increase in the prices of farm products.

128. In 1916 the average labor income of the farmers of this area was greater than the average labor income of the farmers at Hyde Park. This variation in labor income was undoubtedly due to the changes in the relative prices of farm products and the variation in the successes or failures of the various crop and stock enterprises in each area.

129. The type of farming at Beaver is more extensive than at Hyde Park largely because of the following factors:

(a) Climate
(b) Soil
(c) Markets
(d) National Forest ranges and winter ranges
(e) Competition of farm enterprises

130. Range cattle and sheep are the principal sources of income largely because of distance to market and the low cost of livestock production.

131. Alfalfa and other hay are the principal crops grown because of the necessity of providing winter feed for cattle and some sheep. Other crops grown are largely for stock feed or for the local market and are not important.

MONROE, SEVIER COUNTY, UTAH

132. Monroe is in the central part of the southwest quarter of Sevier County. It is three miles from Elsinore, the nearest railway station. Elsinore is on the Marysvale Branch of the Denver and Rio Grande, or Rio Grande Western Railroad.

133. The population of Monroe in 1910 was 1227. Those persons of the population who are not native born citizens, are largely from northwestern Europe, and are familiar with general agricultural practices. Here, as at Hyde Park and Beaver, most of the farm families live in town.

134. The elevation of Monroe is 5380 feet above mean sea level, or about 900 feet higher than Hyde Park.

135. In spite of the fact that Monroe is about 300 miles south of Hyde Park, the average length of the growing season is only 110 days,

or 40 days less, and two weeks later than at Hyde Park. The average date of the last killing frost in spring is May 28, as compared with May 10, at Hyde Park. The mean annual temperature is 48 degrees F. or 0.5 degrees F. less than Beaver and about 0.4 degrees F. greater than for Hyde Park. The average annual precipitation is only 8.34 inches, only 3.48 inches of which fall from April 1 to September 30. On this account dry-farming is not practised. All crops are irrigated.

136. This area is in the Great Interior Basin Soil Province, and the soils are classified by the U. S. D. A. Bureau of Soils. The texture of the soils is similar to that of the other areas previously discussed.

137. There is here, also, some low wet meadow and pasture land due to over irrigation and seepage water.

138. The irrigation canals are owned and operated by the farmers who use the water.

139. There is a sugar factory at Austin, three miles north of Monroe. This factory makes it possible for Monroe farmers to grow sugar-beets. A cooperative cheese factory is situated at Monroe so that dairying is also developing here.

140. One of the main auto roads of the State, running north and south, passes thru town. The wagon roads are in good condition the greater part of the year. The distance from the farms to market for the most important farm product varies from ½ to 7 miles.

141. Monroe is not handicapped to such an extent as Beaver respecting markets nor is it quite as well situated as Hyde Park. But as with Beaver, the main farm enterprises here are sheep and cattle, because of the distance to any large market and the low cost of livestock feed.

142. The special feature about this area is the raising of February lambs for the early Los Angeles market. Los Angeles buyers are on the ground at selling time, and usually pay fair prices for these lambs.

143. Dairying and sugar-beet raising are becoming more important as the markets are developed. Here, as at Hyde Park, there is a direct correlation between size of farm family and acres of sugar-beets grown, and number of cows milked.

144. More than 61 per cent of the land was growing hay in 1914, most of which was alfalfa.

145. Sugar-beets and some wheat were grown as cash crops.

146. Oats, rye, and barley were grown for feed.

147. Some potatoes and sweet corn were grown for home use and to supply the local market.

148. The Monroe farmers are "getting ahead." Their farm business is fairly profitable. The average labor income in 1914 was $516 with interest charged at 5 per cent, $363 with interest at 5.5 per cent, $196 with interest at 8 per cent, $132 with interest at 8.6 per cent, and $89 with interest figured at 9 per cent. In 1914, these farms were less profitable than those at Hyde Park and more profitable than those at Beaver. In 1915 and 1916, however, these farms were more profitable than those at either Hyde Park or Beaver. This variation in profitableness is undoubtedly due to the variations in the relative prices of farm products, especially meat and wool, as well as to the variations in the successes and failures of the crop and stock enterprises. The high prices of lambs and wool have made the war years more profitable for the Monroe farmers.

SANDY, SALT LAKE COUNTY, UTAH

149. Sandy is about 20 miles south of Salt Lake City. Draper is south of Sandy. The farm business records treated in this area were taken in the townships of Sandy, Draper, Midvale, Jordan, and West Jordan.

150. The elevation at Sandy is 4366 feet above mean sea level, or lower than any of the 8 areas studied.

151. In 1910, Sandy had a population of 1037. There were many foreigners and persons with limited farm experience on the farms here.

152. The normal annual precipitation is 16 inches, 7 of which fall in the crop growing season. There are 89 days with .01 inch or more of precipitation, and the mean annual temperature is 51.4 degrees F. There is a greater amount of precipitation during the crop growing season, more stormy days, and a higher mean annual temperature in this area than in any of the 8 areas studied. Dry-farming is successful in this area where soils and topography are suitable. There are 183 days in the average growing season which is 30 days more than in any other area included in this study. The average date of the last killing frost in spring is April 19, showing that the season is not only longer but also earlier than in any area studied.

153. The soils of this area are typical of those of the Great Interior Basin Province. The soil types identified by the U. S. D. A. Bureau of Soils are: Jordan sandy loam, Bingham gravelly loam, Jordan loam, Jordan clay and clay loam, Jordan meadows, Jordan sand, Bingham stony loam, and Salt Lake sand. At Sandy the soil is predominately a sandy loam. As in all Utah valleys, the soil is coarse near the mouth of the canyons at the base of the mountains, and heavy in the bottom of the valley. When irrigated and well drained, these soils are very fertile as shown by the crop yields. Some of the land is low and wet and crop yields are low on such fields.

154. Here as at Hyde Park and Monroe, the number of cows milked increases as the farm families increase in size.

155. There is a great variety of crop and stock enterprises on farms in this district.

156. Because of the climatic, market, soil, water, and transportation conditions, a wide selection of enterprises is offered these farmers. Each farmer has his own set of conditions and he attempts to meet them to his best advantage. Consequently there is a great diversity of practices

157. Some farmers sell market milk to Salt Lake City, some ship milk to creameries, some ship to cheese factories, and a few make butter on the farms and sell it at retail. Some farmers raise hay for the Salt Lake City market, while others raise it to feed their own stock and even buy hay and grain in addition. The surplus poultry and eggs are sold to laborers of the smelters, to private parcel post customers in Salt Lake, or to a store at Sandy, Draper, or elsewhere.

158. The farm receipts were from grain, hay, potatoes, sugar-beets, vegetables, fruits, straw, dairy products, cattle, horses, sheep, wool, hogs, poultry, eggs, honey, outside labor, and increase in inventory. Grain was the main source of income. On the average, there were 7.8 crops grown per farm, and 5.8 sources of income per farm.

159. In 1914, with interest calculated at the rate of 5 per cent, the average labor income was $373; with interest at 5½ per cent, labor income was $294; with interest at 8 per cent, labor income was minus $102; with interest at 8.6 per cent, labor income was minus $196; and with interest at 9 per cent, labor income was minus $260. In 1915 the labor income was greater than in 1914 or 1916 and was in that year also greater than the average labor income of the farmers of Hyde Park. However, the farms of the group changed greatly in 1916, or undoubtedly that would have been the banner year of the three. It is no doubt true, that the increase in the value of the land was sufficient to make up normal profits to the landlords who are operating these farms. Crop yields are not as good as at Hyde Park, yet the land is valued higher on the average here than at Hyde Park. This is because

of markets, climate, and to the future uses other than agriculture to which these lands may be put.

FERRON, EMERY COUNTY, UTAH

160. Ferron is in the southwest corner of the northwest quarter of Emery County. It is on Ferron Creek east and near the base of the Wasatch range of mountains. The waters of Ferron Creek flow thru the San Rafael, Green, and Colorado Rivers, and empty into the Gulf of California.

161. The population of Ferron in 1910, was 651. Those farmers not native born were from northwestern Europe and Great Britain.

162. The elevation at Ferron is 5500 feet above mean sea level.

163. The normal annual precipitation is 9 inches, 5 of which fall in the growing season. The annual precipitation has varied from 3 to 13 inches. There are on the average only 37 stormy days out of 365. It is necessary to irrigate all farm crops in this area. Ranges are poor because of low precipitation. The mean annual temperature is 46.1 degrees F. There are only 107 days in the average crop-growing season, June 2, to September 17.

164. Ferron is in the Rocky Mountain Valleys, Plateaus, and Plains Soil Province. The soil is not as good here as at Hyde Park, yet it is fairly fertile and under favorable conditions produces good crops as shown by the crop yields.

165. While climate and soil handicap this area some, yet the greatest handicap is the marketing situation. Ferron is 45 miles from Price, the railroad town where some of the farm and range products from this district are marketed or loaded for shipment to market.

Mining camps, 40 to 60 miles from Ferron also offer an outlet for some farm products. Some apples, plums, and small bush-fruits; vegetables; and melons are marketed at Sunnyside, Hiawatha, Scofield, and other mining camps. Peddlers gather these products and butter and meats from farmers and sell them in the camps. In a few instances the peddlers are the farmers themselves. Some grain and baled hay are also sold in the camps. The principal source of income is range cattle. Stock can be driven to the railroad and shipped out to the great central markets.

166. Some cattle are grazed on the Manti National Forest, but most of them are grazed on the prairies or plateaus south, east, and west of Ferron. Because of the severe winter weather and the lack of winter grazing, these range cattle are fed on the farms in winter. Raising their feed is an important part of the farming operations in summer. Some farmers let the cattle stay out so late in the fall that severe storms often cause great losses from cold and starvation.

167. A few farmers have been successful in keeping bees. One farmer has done especially well the past few years with his bee business.

168. Sugar-beets are not grown to any extent here because there is no factory at which to market the beets.

169. Dairying is also limited because of lack of markets.

170. Not much care is given fruit trees because of the uncertainty of the market and the weather. Two orchadists asked the writer's advice about taking out their trees and planting alfalfa. The narrow market is a great handicap to fruit growing.

171. Yet with all of these handicaps the lower valuation of land and smaller capital requirements make it possible for these farmers to make fair labor incomes. In 1914 using an interest rate of 5 per cent, the average labor income of the Ferron farmers was $326; using a 5.5 per cent interest rate, it was $291; using an 8 per cent interest rate, it was $117; using an 8.6 per cent interest rate, it was $75; and using 9 per cent

as the interest rate it was $47. In 1915 the average labor income was about the same as in 1914, but in 1916 it was much greater than in either of the other two years.

WELLINGTON, CARBON COUNTY, UTAH

172. Wellington is situated west and south of the central part of Carbon County. It is about 12 miles southeast of Price on the Denver and Rio Grande Railroad.

173. In 1910 the population of Wellington was 358. Here, as elsewhere in Utah, most of the farmers live in town and their farming lands are from 1 to 5 or 7 miles away, surrounding the town.

174. The elevation is 5540 feet above mean sea level.

175. The normal annual precipitation is only 7 inches, of which but 4 inches fall from April 1 to September 30.

176. The climate, soil, topography, camp markets, and type of farming are very similar to those at Ferron, Emery County. Proportionately more livestock, however, are raised at Wellington than at Ferron. There are also more sheep in proportion to cattle here than at Ferron due largely to the range conditions. Alfalfa is the principal crop.

177. Records were taken here one year only, 1914, and then but 26 business statements were obtained as this is a small and limited area.

178. The average labor income of the 26 Wellington farmers in 1914 was $165 when interest was charged at 8 per cent, the average mortgage rate for the state. The average capital investment was $8391 so that 8 per cent interest amounts to $671. Undoubtedly the years 1915 and 1916, were considerably more profitable than 1914 because of the increased livestock prices.

HINCKLEY, MILLARD COUNTY, UTAH

179. Hinckley is situated in about the center of the northeast quarter of Millard County. It is about 6 miles north and west of Oasis, which is the nearest railway station.

180. In 1910 the population of Hinckley was 553. The majority of the persons are native-born citizens of the United States. There were a few persons from Sweden, Denmark and Great Britain.

181. The elevation at Hinckley is about 4541 feet above mean sea level.

182. The normal annual precipitation is about 8 inches, only 4 inches of which fall during the growing season. Because of this light rainfall, dry-farming is not practised. All farm crops are irrigated.

183. The Nebo National Forest to the east of Hinckley is too far away to be of any value to the farmers of this area, so the range land is very limited and what range there is is not of excellent quality.

184. This area is in the Great Interior Basin Soil Province. The soil is not as fertile as that at Hyde Park and because of poor natural drainage, is inclined to be alkaline. Clay and clay loam predominate although there is some sandy loam reported. The land in general is flat; often it is too flat to irrigate conveniently.

185. Alfalfa is by far the most important crop grown. Other crops grown are: other hay, spring wheat, winter wheat, oats, rye, corn, and garden products.

186. Dairying is practised on some farms in a limited way, but has not yet developed to any sizable proportions nor is it likely to do so in the near future.

187. The main sources of income in 1914 were: (1) alfalfa seed, (2) alfalfa hay and other hay, and (3) cattle. The growing of alfalfa seed on most farms of this area is quite a gamble. But on a few farms a fairly good crop is obtained each year. When a crop of seed is

obtained, the farmer makes a very good labor income, but when the crop is left for seed and the seed fails, the dry stalks are not of great value and labor income in such cases is often a minus quantity.

188. In brief, Hinckley about feeds itself, but its clothes, household goods, and other necessaries it buys outside and pays for them with alfalfa seed, hay, cattle, farm butter, surplus eggs, farm-dressed pork, a few horses, and personal services.

189. The type of farming followed is fairly well adapted to conditions and on the average is also fairly profitable. In 1914, using 5 per cent interest the average labor income of the Hinckley farmers was $613; using 5.5 per cent interest, $565; using 8 per cent $323; using 8.6 per cent, $266; and using 9 per cent, labor income was $228. In 1915 the average labor income was less than in 1914, due largely to the fact that the alfalfa seed crop was not quite as good. In 1916 the labor income on the average was about the same as in 1914. The seed crop was not quite so good but prices were higher.

PLEASANT GROVE, UTAH COUNTY, UTAH

190. Pleasant Grove is situated just south of east of the north end of Utah Lake in Utah County.

191. The 1910 U. S. Census gave the population of Pleasant Grove as 1618. The farmers live in town while their farms are on the outskirts and in the outlying area. The people here are native born, or are from northwestern Europe or Great Britain.

192. The elevation is 4532 feet above mean sea level.

193. The normal annual precipitation is 15 inches, 6 of which fall in the growing season. Dry-farming is successfully practised here. The absolute lowest annual precipitation recorded is 9 inches and the absolute highest annual precipitation recorded is 22 inches. There are on the average, 66 days annually with .01 inch or more precipitation. The mean annual temperature is 49.7 degrees F. This is higher than for Hyde Park but lower than for Sandy. The warmest temperature recorded for any of the 8 areas is 105 degrees F. and that was recorded in the Pleasant Grove area. The average crop growing season has 145 days, or a few less than Hyde Park, and 35 to 40 less than Sandy, although situated further south than either of these areas. The average date of last killing frost in spring is May 12, or about the same as for Hyde Park, but a little earlier than Beaver, and much later than Sandy. The absolute latest date of killing frost is June 29, or about the same as at Hyde Park and Monroe.

194. This area is situated in the Great Interior Basin Soil Province. A detailed soil survey has been made of this area and the following soil types distinguished: Maricopa stony loam, Maricopa gravelly loam, Jordan clay, Fresno sand, Jordan loam, Jordan sandy loam, Salt Lake loam, and the gravel areas. These same soils are among those identified in the Sandy area. The best sugar-beet soil is the Jordan sandy loam, and the Jordan loam is the second best soil for this crop.

195. Creeks from the mountain cañyons on the east of Pleasant Grove and flowing wells furnish the irrigation water for the farms. The irrigation systems are owned and operated by the farmers themselves.

196. Transportation by rail and auto roads is easy and adequate. Sugar-beets are shipped to the Lehi factory from this area.

197. The Wasatch National Forest east of town offers good grazing for stock for about 8 months of the year. More cattle than sheep were kept on this range because of adaptability and profitableness during these years.

198. The principal sources of income in 1916 in the order of importance were: sugar-beets, cattle sales, outside labor, grain, potatoes, fruit, increase in feed and supply inventory, swine sales, poultry and

eggs, increase in livestock inventory, hay, horse sales, increase in machinery inventory, other crop sales, increase in inventory of land and buildings, and sheep sales.

199. The average labor income of these farmers in 1916, using 5 per cent interest was $651; using 5.5 per cent interest, $612; using 8 per cent interest, $418; using 8.6 per cent interest, $370; and using 9 per cent interest, the labor income was $340. There is no doubt but that the years 1915 and 1914 would have shown a smaller labor income than 1916, because the farm prices were not as high then as in 1916.

GENERAL CONCLUSIONS

200. It has been shown in this thesis that there are a multitude of factors that affect type of farming in Utah. Some of these factors are: (1) Location of the area, (2) elevation, (3) crops, (4) crop diseases, (5) livestock, (6) crop and stock combinations, (7) pasture, (8) the returns from crops and stock, (9) diversity and balance of farm business, (10) size of farm business, (11) farm machinery, (12) buildings, (13) climate, (14) topography, (15) soil, (16) National Forests and public stock ranges, (17) population, (18) the farm family, (19) farm labor, (20) markets, (21) wagon and auto roads and railroads, (22) land-tenure, (23) land values, (24) water-tenure, (25) water-rights, (26) canal ownership and operation, (27) duty of water, (28) irrigation practice, (29) amount of irrigation water necessary, (30) amount of water to use and time of application, (31) farm credit, (32) farm mortgages, (33) other security, (34) interest rates, (35) farm profits, (36) labor incomes, (37) rents, and (38) what the farm furnishes towards the living of the farm family.

In any specific area, however, or on any particular farm, the type of farming is determined by the combinations and inter-relations of all these natural and economic factors.

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APPENDIX

Table I.—Business Factors of Farms of Hyde Park Area, Cache County, Utah, 1914, Showing Type of Farming

	Average of 10 better-paying farms	Average of all 52 farms
Diversity of Farming		
Number of crops grown	5.1	4.6
Number sources income over 8 per cent gross receipts	4	3
Sources of income over 8 per cent gross receipts:		
Sugar-beets	$ 1,075	$ 705
Creamery milk	597	400
Grain	891	302
Cattle	356	—
Size of Farm Business		
Capital	$19,816	$13,642
Receipts in farm	4,133	2,510
Acres in farm	226	105
Crop acres	105	54
Acres sugar-beets	12.8	8.5
Milk Cows	10.1	7.5
Work horses	5.6	4.0
Productive animal units (P.A.U.)	23.7	14.8
Man labor equivalent (year basis)	2.0	1.6
Productivity of Crops		
Crop receipts per crop acre	$ 21	$ 22
Crop yields per acre:		
Potatoes	205 bu.	178 bu.
Wheat (spring and winter)	24 bu.	26 bu.
Oats	71 bu.	70 bu.
Barley (both dry-farm and irrigated)	23 bu.	28 bu.
Alfalfa	3.6 tons	4 tons
Other hay	2.4 tons	2.6 tons
Sugar-beets	18.6 tons	18.6 tons
Productivity of Livestock		
Net livestock receipts per $100 feed fed	$ 120	$ 107
Net livestock receipts per P. A. U.	60	60
Cattle receipts per head	22	22
Milk receipts per cow	62	56
Man Labor Efficiency		
Productive animal units per man	12	9
Crop acres per man	52	33
Horse Labor Efficiency		
Crop acres per work horse	19	14
Labor Income	$ 1,997	$ 946

Table II.—Business Factors of Farms of the Hyde Park Area, Cache County, 1915, Showing Types of Farming

	Average of 10 better-paying farms	Average of 10 least profitable farms	Average of all 48 farms
Diversity of Farming			
Percentage of total farm receipts from stock	38	27	35
Size of Farm Business			
Total farm capital	$14,358	$12,688	$11,987
Total working capital	2,962	2,458	2,559
Total farm receipts	3,041	1,386	1,987
Total farm expenses	877	845	799
Total crop receipts	1,569	958	1,050
Net livestock receipts	1,174	387	724
Total receipts from dairy products	470	312	414
Value of feed fed to livestock	881	744	750
Total acres in farm	167	106	107
Total crop acres	63	51	52
Total productive animal units (P. A. U.)	20	16	16
Total work horses	4	4	4
Total men (1 year basis)	1.5	1.6	1.6
Productivity of Crops	(See tables 4 and 5 in text)		..
Productivity of Livestock			
Net livestock receipts per $100 feed fed	$ 133	$ 52	$ 97
Net livestock receipts per P.A.U.	57	24	25
Receipts per cow dairy products	70	38	54
Man Labor Efficiency			
Productive animal units per man	14	10	10
Crop acres per man	42	31	33
Horse Labor Efficiency			
Crop acres per work horse	15	14	14
Labor Income	$ 1,446	$ −93	$ 589

Table III.—Business Statement of 10 Better-paying Farms of the Beaver Area, Beaver County, Utah, 1914, Showing Type of Farming

	No.	Value
Farm Capital		
Total acres in farm	167	$11,407
Milk cows	7	434
Other cattle	114	3,836
Horses and colts	10	715
Sheep	394	2,550
Hogs	10	81
Poultry and bees	54	38
Machinery		740
Feed and supplies		666
Cash		170
Total Farm Capital		$20,637
Farm Receipts		
Crops:		
Potatoes		$ 61
Grain		171
Hay		358
Fruit and vegetables		20
Livestock		
Dairy products		211
Cattle		1,202
Horses		148
Sheep and wool		1,183
Hogs		71
Poultry and eggs		60
Miscellaneous receipts		254
Increase in feed and supplies		202
Total Farm Receipts		$ 3,941
Farm Expenses		
Hired Labor		$ 600
Machinery repairs and depreciation		74
Buildding and fence repairs and depreciation		119
Feed		47
Horseshoeing		10
Breeding fees and seeds		18
Threshing and twine (excludes toll)		17
Machine work hired		31
Taxes		284
Water tax		25
Cash rent and forest reserve fees		18
Miscellaneous expenses		21
Value of family labor		96
Total Farm Expenses		$ 1,360
Farm Income (Receipts minus expenses)		2,581
Interest on Total Farm Capital (at 8 per cent)		1,651
Labor Income		930

Table IV.—Business Factors of Farms of Beaver Area, Beaver County, Utah, 1914, Showing Type of Farming

	Average of 10 better-paying farms	Average of all 50 farms
Diversity of Farming		
Number of sources of income	6.1	5.4
Number of crops grown	7.0	6.4
Number of sources income over 10 per cent gross receipts	2	2
Sources of income over 10 per cent gross receipts:		
Cattle	$ 1,202	$ 627
Sheep	1,183	301
Size of Farm Business		
Total capital	$20,637	$14,158
Total acres	167	179
Crop acres	105	69
Acres alfalfa and other hay	89	51
Hogs	10	6
Men	1.8	1.4
Other cattle	114	47
Productive animal units	150	66
Productivity of Crops		
Crop receipts per crop acre	$ 6	$ 5
Crop yields per acre:		
Potatoes	132 bu.	115 bu.
Spring wheat	23 bu.	23 bu.
Oats	43 bu.	40 bu.
Alfalfa	2.2 tons	2.4 tons
Other hay	1.7 tons	1.9 tons
Productivity of Livestock		
Net livestock receipts per $100 feed fed	$ 229	$ 153
Net livestock receipts per P. A. U.(1)	19	20
Cattle receipts per head(2)	11	13
Milk receipts per cow	32	17
Man Labor Efficiency		
Miscellaneous receipts per man	$ 139	$ 157
Productive animal units per man	82	46
Crop acres per man	58	46
Horse Labor Efficiency		
Crop acres per work horse	22	16
Labor Income	$ 930	$ −29

(1) "A. U." represents "Animal Units", "P. A. U." represents "Productive Animal Units". Work Horses are not counted here as Productive Animal Units.

(2) Does not include milk cows.

Table V.—Business Statement of Farms of Beaver Area, Beaver County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 40 farms
Farm Capital			
Real estate	$ 8,315	$10,050	$ 8,174
Livestock	5,056	4,667	3,402
Machinery and tools	873	479	555
Feed and seeds	498	542	464
Cash	75	10	32
Total Farm Capital	$14,817	$15,748	$12,627
Farm Receipts			
Crops	$ 324	$ 349	$ 319
Livestock	2,790	758	1,255
Miscellaneous receipts	441	102	228
Increase in feed and seed inventory	364	34	189
Total Farm Receipts	$ 3,919	$ 1,243	$ 1,988
Farm Expenses			
Current farm expenses	$ 1,013	$ 686	$ 665
Depreciation in mach., bldgs., fences	185	172	140
Decrease in inventory of feed and seed	0	0	0
Total Farm Expenses	$ 1,198	$ 858	$ 805
Farm Income (Receipts-expenses)	2,721	385	1,183
Interest on Total Farm Capital (at 8 per cent)	1,183	1,260	1,010
Labor Income	$ 1,538	$ −875	$ 173

Table VI.—Business Factors of Farms of the Beaver Area, Beaver County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 40 farms
Diversity of Farming			
Percentage of total farm receipts from stock	71	57	62
Size of Farm Business			
Fixed Farm Capital (Real Estate)	$ 8,315	$10,050	$ 8,174
Working Capital	6,502	5,699	4,471
Farm receipts	3,919	1,243	1,988
Farm expenses	1,198	858	805
Net livestock receipts	2,790	758	1,255
Receipts from dairy products	279	112	209
Acres in farm	138	158	190
Crop acres	65	73	62
Productive animal units (P. A. U.)	83	73	54
Work horses	4	5	4
Men (1 year basis)	2	1.5	1.6
Productivity of Livestock			
Net livestock receipts per $100 feed fed	$ 265	$ 72	$ 138
Net livestock receipts per P. A. U.	34	10	24
Receipts per cow dairy products	47	17	30
Horse Labor Efficiency			
Crop acres per work horse	18	15	16
Labor Income	$ 1,538	$ −875	$ 173

Table VII.—Business Statement of Farms of Beaver Area, Beaver County, Utah, 1916, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 44 farms
Farm Capital			
Real estate	$ 9,261	$ 8,660	$ 7,078
Land	1,720	1,955	1,696
Buildings	6,332	2,385	3,057
Livestock	866	443	504
Machinery	698	679	580
Feed and supplies			
Total Farm Capital	$18,877	$14,122	$12,915
Farm Receipts			
Crops	$ 60	$ 47	$ 77
Potatoes	86	171	155
Grain	130	239	193
Hay	10	19	7
Other crops			
Livestock	348	254	260
Dairy products	52	20	44
Poultry and egg sales	634	277	292
Cattle sales	52	143	83
Horse sales	2,032	—	467
Sheep sales	193	101	122
Swine sales	545	296	334
Other receipts	1,744	127	729
Increase livestock inventory	24	98	26
Increase machinery inventory	392	—	159
Increase feed and supplies			
Total Farm Receipts	$ 6,302	$ 1,792	$ 2,948
Farm Expenses			
Blacksmith and machine work	$ 53	$ 43	$ 51
Hired labor	494	145	185
Machinery, building and fence material	104	152	72
Feeds and seeds	196	30	67
Fees, rents, and taxes	280	189	200
Other expenses	59	15	25
Livestock purchased	823	494	473
Decrease in feed and supplies	—	108	—
Decrease in land and buildings	31	39	33
Value of family labor	215	60	98
Total Farm Expenses	$ 2,255	$ 1,275	$ 1,204
Farm income (Receipts-expenses)	$ 4,047	$ 517	$ 1,744
Interest on Total Farm Capital (at 8 per cent)	1,510	1,130	1,033
Labor Income	$ 2,537	$ −613	711

Table VIII.—Business Statement of 10 Better-paying Farms of the Monroe Area, Sevier County, Utah, 1914, Showing Type of Farming

	No.	Value
Farm Capital		
Total acres in farm	104	$11,474
Milk cows	10	594
Other cattle	24	923
Horses and colts	9	1,106
Sheep	334	1,480
Hogs	9	82
Poultry and bees	73	58
Machinery		636
Feed and supplies		633
Cash		400
Total Farm Capital		$17,386
Farm Receipts		
Crops		
Potatoes		$ 116
Grain		80
Hay		229
Sugar-beets		464
Fruits and vegetables		24
Livestock		
Dairy products		274
Cattle		731
Horses		145
Sheep and wool		1,992
Hogs		66
Poultry and eggs		164
Miscellaneous receipts		350
Increase in feed and supplies		97
Total Farm Receipts		$ 4,732
Farm Expenses		
Hired labor		$ 588
Machinery repairs and depreciation		43
Building and fence repairs and depreciation		126
Feed		425
Horseshoeing		19
Breeding fees and seeds		23
Threshing and twine (excludes toll)		15
Machine work hired		13
Taxes		221
Water tax		78
Cash rent and forest reserve fees		277
Miscellaneous expenses		93
Value of family labor		154
Total Farm Expenses		$ 2,075
Farm Income (Receipts-expenses)		$ 2,657
Interest on Total Farm Capital (at 8 per cent)		1,391
Labor Income		$ 1,266

Table IX.—Business Factors of Farms of Monroe Area, Sevier County, Utah, 1914, Showing Type of Farming

	Average of 10 better-paying farms		Average of all 63 farms	
Diversity of Farming				
Number of sources of income	6.9		6.2	
Number of crops grown	4.8		4.8	
Number sources income over 10 per cent gross receipts	2		2	
Sources of income over 10 per cent gross receipts:				
Sheep	$ 1,992		$ 453	
Cattle	731		271	
Size of Farm Business				
Farm capital	$17,386		$10,668	
Farm area (acres)	104		59	
Crop acres	74		44	
Acres alfalfa	50		25	
Number of sheep	334		107	
Number of milk cows	10		6	
Number of other cattle	24		10	
Number of animal units(1)	73		32	
Number of productive animal units(2)	68		28	
Productivity of Crops				
Crop receipts per crop acre	$ 12		$ 13	
Crop yields per acre:				
Potatoes	218	bu.	157	bu.
Spring wheat	33	bu.	31	bu.
Oats	49	bu.	49	bu.
Alfalfa	3.8	tons	4	tons
Other hay	4	tons	3	tons
Sugar-beets	11	tons	11	tons
Productivity of Livestock				
Net livestock receipts per $100 feed fed	$ 179		$ 125	
Net livestock receipts per animal unit	46		34	
Cattle receipts per head(3)	30		26	
Milk receipts per cow	27		28	
Man Labor Efficiency				
Miscellaneous receipts per man	$ 160		$ 129	
Animal units per man	33		20	
Productive animal units per man(3)	31		18	
Crop acres per man	34		28	
Horse Labor Efficiency				
Crop acres per work horse	14		11	
Labor Income	$ 1,266		$ 196	

(1) Includes work horses.
(2) Does not include work horses.
(3) Does not include milk cows.

Table X.—Business Statement of Farms of the Monroe Area, Sevier County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 38 farms
Farm Capital			
Real estate	$ 9,780	$ 6,675	$ 7,246
Livestock	6,315	1,084	2,607
Machinery	572	472	469
Feed and seeds	517	180	325
Cash	392	51	141
Total Farm Capital	$17,576	$ 8,462	$10,788
Farm Receipts			
Crops	$ 614	$ 446	$ 546
Livestock and livestock products	4,672	484	1,653
Miscellaneous	256	130	192
Increase in feed and seed inventory	120	32	100
Total Farm Receipts	$ 5,662	$ 1,092	$ 2,491
Farm Expenses			
Current farm expenses	$ 2,008	$ 597	$ 940
Dep. of machinery, buildings and fences	102	110	98
Total Farm Expenses	$ 2,110	$ 707	$ 1,038
Farm Income (receipts-expenses)	$ 3,552	$ 385	$ 1,453
Interest on Total Farm Capital at 8 per cent	1,406	677	863
Labor Income	2,146	$ −292	590

Table XI.—Business Factors of Farms of the Monroe Area, Sevier County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 38 farms
Diversity of Farming			
Percentage of total farm receipts from stock	82	46	66
Productive animal units per 100 acres crops	234	46	106
Crop acres per productive animal unit	0.43	2.2	0.9
Size of Farm Business			
Farm capital	$17,576	$ 8,462	$10,788
Working capital	7,796	1,787	3,542
Farm receipts	5,662	1,092	2,491
Farm expenses	2,110	707	1,038
Crop receipts	614	446	546
Net livestock receipts	4,672	484	1,653
Receipts from dairy products	235	123	188
Value of feed fed to livestock	1,846	615	928
Acres in farm	76	45	54
Crop acres	56	39	44
Productive animal units (P.A.U.)	131	18	47
Work horses	5	3	4
Men (1 year basis)	2.1	1.3	1.6
Productivity of Crops			
Crop indedx(1)	110	85	100
Crop yields per acre:			
Potatoes			149 bu.
Spring wheat			36 bu.
Oats			52 bu.
Barley			62 bu.
Alfalfa			3.3 tons
Other hay			4.8 tons
Sugar-beets			10.2 tons
Productivity of Livestock			
Net livestock receipts per $100 feed fed	$ 253	$ 79	$ 178
Net livestock receipts per P.A.U.	36	27	36
Man Labor Efficiency			
Productive animal units per man	61	14	26
Labor Income	$ 2,146	$ −292	$ 590

(1) Crop index shows the yields per acre compared to the average yields of the area when each crop is given its proper proportion by weighting by acreages harvested.

Table XII.—Business Statement of Farms of the Monroe Area, Sevier County, Utah, 1916, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 57 farms
Farm Capital			
Real estate:			
Land	$ 9,005	$ 2,748	$ 5,303
Buildings	1,790	1,088	1,416
Livestock	6,749	697	2,552
Machinery	569	281	450
Feed and supplies	514	198	430
Total Farm Capital	$18,627	$ 5,012	$10,151
Farm Receipts			
Crops:			
Potatoes	$ 40	$ 14	$ 32
Grain	262	76	204
Hay	783	12	200
Sugar-beets	555	102	387
Fruit	—	—	3
Other crops	—	31	7
Livestock:			
Dairy products	196	97	183
Poultry and egg sales	51	25	57
Cattle sales	1,213	177	543
Horse sales	28	14	57
Sheep sales	2,501	22	613
Swine sales	311	49	115
Other receipts	1,100	103	380
Increase in livestock inventory	1,222	—	433
Increase in machinery inventory	33	—	8
Increase in feed and supplies	621	71	418
Increase in land and buildings	30	—	—
Total Farm Receipts	$ 8,946	$ 793	$ 3,640
Farm Expenses			
Blacksmith and machine work	$ 135	$ 25	$ 86
Hired labor	782	17	259
Machinery, building, and fence material	207	25	115
Feed and seeds	341	39	139
Fees, rents and taxes	517	82	246
Other expenses	256	5	56
Livestock purchased	2,248	83	746
Decrease in livestock inventory	—	38	—
Decrease in machinery inventory	—	18	—
Decrease in land and buildings	—	40	2
Value of family labor	110	66	131
Total Farm Expenses	$ 4,596	$ 438	$ 1,780
Farm Income (Receipts-expenses)	$ 4,350	$ 355	$ 1,860
Interest on Total Farm Capital at 8 per cent	1,490	401	812
Labor Income	$ 2,860	$ −46	1,048

Table XIII.—Business Statement of 10 Better-paying Farms of the Sandy Area, Salt Lake County, Utah, 1914, Showing Type of Farming

	No.	Value
Farm Capital		
Total acres in farm	130	$23,788
Milk cows	9	691
Other cattle	13	524
Horses and colts	9	1,013
Sheep	7	27
Hogs	12	116
Poultry	72	45
Machinery		1,027
Feed and supplies		576
Cash		95
Total Farm Capital		$26,902
Farm Receipts		
Crops		
Potatoes		$ 128
Grain		704
Hay		536
Straw		32
Sugar-beets		295
Fruit and vegetables		127
Livestock		
Dairy products		1,035
Cattle		407
Horses		108
Sheep and wool		19
Hogs		211
Poultry and eggs		71
Miscellaneous receipts		712
Increase in feed and supplies		282
Total Farm Receipts		$ 4,667
Farm Expenses		
Hired labor		$ 791
Machinery repairs and depreciation		44
Building and fence repairs and depreciation		43
Feed		110
Horseshoeing and veterinary fees		30
Breeding fees and seeds		76
Threshing and twine (excludes toll)		45
Machine work hired		48
Taxes		123
Water tax		71
Cash rent and forest reserve fees		77
Miscellaneous expenses		97
Value of family labor		368
Total Farm Expenses		$ 1,923
Farm Income (receipts minus expenses)		2,744
Interest on Total Farm Capital (at 8 per cent)		2,152
Labor Income		592

Table XIV.—Business Factors of Farms of Sandy Area, Salt Lake County, Utah, 1914, Showing Type of Farming

	Average of 10 better-paying farms	Average of all 72 farms
Diversity of Farming		
Number of sources of income	6.5	5.8
Number of crops grown	6.9	7.8
Number sources income over 10 per cent gross receipts	2	2
Sources of income over 10 per cent gross receipts:		
Grain	$ 704	$ 301
Sheep, hogs, poultry, and bees	—	272
Milk and butter	1,035	—
Size of Farm Business		
Capital	$26,902	$15,828
Acres in farm	130	100
Crop acres	104	55
Acres sugar-beets	4	3
Number of men	2.6	1.7
Number of milk cows	8.8	4.4
Number of work horses	6.6	4.1
Productive animal units	22.4	15.3
Productivity of Crops		
Crop receipts per crop acre	$ 18	$ 17
Crop yields per acre:		
Potatoes	135 bu.	113 bu.
Wheat	21 bu.	27 bu.
Oats	51 bu.	41 bu.
Barley	48 bu.	46 bu.
Alfalfa	3.7 tons	3.4 tons
Other hay	3.1 tons	2.8 tons
Sugar-beets	15.4 tons	12.1 tons
Productivity of Livestock		
Net livestock receipts per $100 feed fed	$ 148	$ 94
Net livestock receipts per P. A. U.	86	48
Cattle receipts per head	32	25
Milk receipts per cow	117	53
Man Labor Efficiency		
Productive animal units per man	9	9
Crop acres per man	40	32
Horse Labor Efficiency		
Crop acres per work horse	16	13
Labor Income	$ 592	$ −102

Table XV.—Business Statement of Farms of Sandy Area, Salt Lake County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 47 farms
Farm Capital			
Real estate	$11,412	$12,508	$10,981
Livestock	2,423	1,193	1,372
Machinery and tools	614	412	465
Feeds and seeds	392	294	362
Cash	40	31	40
Total Farm Capital	$14,881	$14,438	$13,220
Farm Receipts			
Crops	$ 1,987	$ 674	$ 1,110
Livestock	1,764	457	678
Miscellaneous receipts	565	119	371
Increase in feed and seed inventory	240	38	14
Total Farm Receipts	$ 4,556	$ 1,288	$ 2,173
Farm Expenses			
Current farm expenses	$ 1,171	$ 964	$ 813
Depreciation in Mach., bldgs., fences	97	86	81
Decrease in inventory of feeds and seeds	0	0	0
Total Farm Expenses	$ 1,268	$ 1,050	$ 894
Farm Income (receipts-expenses)	$ 3,288	$ 238	$ 1,279
Interest on Total Farm Capital (at 8 per cent)	1,190	1,155	1,058
Labor Income	$ 2,098	$ −917	$ 221

Table XVI.—Business Factors of Farms of the Sandy Area, Salt Lake County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 47 farms
Diversity of Business			
Productive animal units per 100 acres crops	60	30	40
Size of Farm Business			
Total farm capital	$14,881	$14,438	$13,220
Working capital	3,469	1,931	2,191
Farm receipts	4,556	1,288	2,173
Farm expenses	1,268	1,050	894
Crop receipts	1,987	674	1,110
Value of feed fed to livestock	827	757	733
Net livestock receipts	1,764	457	678
Total acres in farm	601	128	201
Crop acres	63	49	47
Productive animal units (P.A.U.)	38	13	16
Men (1 year basis)	2.1	2	1.7
Productivity of Crops			
Crop index (percentage)	114	93	100
Productivity of Livestock			
Net livestock receipts per $100 feed fed	$ 213	$ 60	$ 92
Net livestock receipts per P. A. U.	47	36	41
Man Labor Efficiency			
Productive animal units per man	18	6	10
Crop acres per man	30	25	27
Horse Labor Efficiency			
Crop acres per work horse	13	10	12
Labor Income	$ 2,089	$ −917	$ 221

Table XVII.—Business Statement of Farms of Sandy Area, Salt Lake County, Utah, 1916, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 45 farms
Farm Capital			
Real estate:			
Land	$ 5,047	$ 8,930	$ 4,985
Buildings	1,475	1,266	1,147
Livestock	1,202	789	828
Machinery	342	352	264
Feed and supplies	350	304	228
Total Farm Capital	$ 8,416	$11,641	$ 7,452
Farm Receipts			
Crops			
Potatoes	$ 64	$ 84	$ 48
Grain	25	153	56
Hay	24	32	24
Sugar-beets	108	48	102
Fruit	103	15	44
Other crops	88	46	70
Livestock			
Dairy products	409	94	155
Poultry and egg sales	147	37	72
Cattle sales	1,340	51	397
Horse sales	81	35	64
Sheep sales	1	11	3
Swine sales	311	67	115
Other receipts	602	192	351
Increase in livestock inventory	266	38	74
Increase in feed and supplies	332	117	151
Total Farm Receipts	$ 3,901	$ 1,020	$ 1,726
Farm Expenses			
Blacksmith and machine work	$ 45	$ 51	$ 38
Hired labor	152	196	98
Mach., bldg., and fence material	20	15	21
Feed and seeds	111	19	58
Fees, rents, and taxes	146	172	133
Other expenses	22	14	15
Livestock purchased	1,367	113	377
Decrease in machinery inventory	19	15	5
Decrease in land and buildings	29	25	23
Value of family labor	105	99	71
Total Farm Expenses	$ 2,016	$ 719	$ 839
Farm income (Receipts-expenses)	$ 1,885	$ 301	$ 887
Interest on Total Farm Capital (at 8 per cent)	673	931	596
Labor Income	$ 1,212	$ −630	$ 291

Table XVIII.—Business Statement of 10 Better-paying Farms of the Ferron Area, Emery County, Utah, 1914, Showing Type of Farming

	No.	Value
Farm Capital		
Total acres in farm	139	$5,235
Milk cows	7	442
Other cattle	20	762
Horses and colts	6	591
Sheep	3	21
Hogs	12	96
Poultry and bees	112	254
Machinery		424
Feed and supplies		237
Cash		32
Total Farm Capital		$8,094
Farm receipts		
Crops		
Potatoes		$ 10
Grain		115
Hay		142
Seeds		74
Fruit and vegetables		183
Livestock		
Dairy products		248
Cattle		298
Horses		151
Sheep and wool		15
Hogs		212
Poultry and eggs		346
Miscellaneous receipts		233
Increase in feed and supplies		2
Total Farm Receipts		$2,029
Farm Expenses		
Hired labor		$ 52
Machinery repairs and depreciation		49
Building and fence repairs and depreciation		94
Feed		42
Horseshoeing		3
Breeding fees and seeds		26
Threshing and twine (excludes toll)		12
Machine work hired		9
Taxes		49
Water tax		22
Cash rent and forest reserve fees		8
Miscellaneous expenses		114
Value of family labor		116
Total Farm Expenses		$ 596
Farm Income (receipts minus expenses)		1,433
Interest on Total Farm Capital (at 8 per cent)		648
Labor Income		785

Table XIX.—Business Factors of Farms of Ferron Area, Emery County, Utah, 1914, Showing Type of Farming

	Average of 10 better-paying farms	Average of all 39 farms
Diversity of Farming		
Number of sources of income	7	6
Number of crops grown	6	6
Number of sources income over 10 per cent gross receipts	2	2
Sources of income over 10 per cent gross receipts:		
Cattle	$ 298	$ 243
Other livestock (hogs, poultry, and bees)	558	218
Size of Farm Business		
Total farm capital	$ 8,094	$ 6,993
Farm area (acres)	139	108
Crop acres	62	53
Acres alfalfa and other hay	37	28
Number milk cows	7	9
Number other cattle	20	19
Productive animal units (P.A.U.)	28	29
Productivity of Crops		
Crop receipts per crop acre	$ 10	$ 6
Crop yields per acre:		
Potatoes	86 bu.	73 bu.
Spring wheat	18 bu.	16 bu.
Oats	39 bu.	32 bu.
Alfalfa	2 tons	1.8 tons
Other hay	1.7 tons	1.7 tons
Productivity of Livestock		
Net livestock receipts per $100 feed fed	$ 238	$ 188
Net livestock receipts per P.A.U.	45	24
Cattle receipts per head	14	13
Milk receipts per cow	36	14
Man Labor Efficiency		
Miscellaneous receipts per man	$ 116	$ 65
Productive animal units per man	22	22
Crop acres per man	39	38
Horse Labor Efficiency		
Crop acres per work horse	19	16
Labor Income	$ 785	$ 117

Table XX.—Business Statement of Farms of Ferron Area, Emery County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 48 farms
Farm Capital			
Real estate	$ 3,581	$ 4,587	$ 3,868
Livestock	2,111	2,151	1,984
Machinery and tools	457	410	382
Feed and seeds	175	206	208
Cash	4	17	15
Total Farm Capital	$ 6,328	$ 7,371	$ 6,457
Farm Receipts			
Crops	$ 458	$ 269	$ 321
Livestock	1,040	423	653
Miscellaneous receipts	371	38	166
Increase in feed and seeds inventory	100	27	41
Total Farm Receipts	$ 1,969	$ 757	$ 1,181
Farm Expenses			
Current farm expenses	$ 479	$ 692	$ 481
Depreciation in mach., buildings, fences	64	65	64
Decrease in inventory of feed and seeds	0	0	0
Total Farm Expenses	$ 543	$ 757	$ 545
Farm Income (receipts-expenses)	$ 1,426	$ 000	$ 636
Interest on Total Farm Capital at 8 per cent)	506	590	517
Labor Income	920	$ –590	$ 119

Table XXI.—Business Factors of Farms of the Ferron Area, Emery County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of-all 48 farms
Diversity of Farming			
Productive animal units per 100 acres crops	70	60	60
Size of Farm Business			
Total farm capital	$ 6,328	$ 7,371	$ 6,457
Working capital	2,747	2,784	2,590
Farm receipts	1,969	757	1,181
Farm expenses	543	757	545
Crop receipts	458	269	321
Net livestock receipts	1,040	423	653
Total acres in farm	74	119	96
Crop acres	45	48	49
P. A. U.	31	29	28
Work horses	2.6	5	3.1
Men (1 year basis)	1.4	1.9	1.5
Productivity of Crops			
Crop index (percentage)	120	95	100
Productivity of Livestock			
Net livestock receipts per $100 feed fed	$ 249	$ 88	$ 131
Net livestock receipts per P. A. U.	33	15	24
Man Labor Efficiency			
Productive animal units per man	22	15	18
Crop acres per man	32	26	33
Horse Labor Efficiency			
Crop acres per work horse	18	9	16
Labor Income	$ 920	$ −590	$ 119

Table XXII.—Business Statement of Farms of Ferron Area, Emery County, Utah, 1916, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 34 farms
Farm Capital			
Real estate			
Land	$ 3,339	$ 3,660	$ 2,866
Buildings	1,248	1,226	1,163
Livestock	3,095	1,958	2,075
Machinery	526	318	397
Feed and supplies	307	229	268
Total Farm Capital	$ 8,515	$ 7,391	$ 6,769
Farm Receipts			
Crops			
Potatoes	$ 10	$ 13	$ 13
Grain	57	28	95
Hay	20	6	11
Fruit	500	17	166
Other crops	104	12	66
Livestock			
Dairy products	81	42	63
Poultry and egg sales	156	56	82
Cattle sales	456	106	221
Horse sales	35	139	91
Sheep sales	21	—	7
Swine sales	105	66	82
Other receipts	445	44	206
Increase in livestock inventory	719	—	253
Increase in machinery inventory	39	—	13
Increase in feed and supplies	154	114	175
Total Farm Receipts	$ 2,902	$ 643	$ 1,544
Farm Expenses			
Blacksmith and machine work	$ 46	$ 38	$ 51
Hired labor	60	1	28
Mach., bldg., and fence material	90	13	64
Feed and seeds	40	23	24
Fees, rents and taxes	147	87	101
Other expense	37	12	26
Livestock purchased	294	26	153
Decrease in livestock inventory	—	57	—
Decrease in machinery inventory	—	15	—
Decrease in land and buildings	56	51	39
Value of family labor	169	76	104
Total Farm Expenses	$ 939	$ 399	$ 590
Farm Income (Receipts-expenses)	$ 1,963	$ 244	$ 954
Interest on Total Farm Capital (at 8 per cent)	681	591	542
Labor Income	$ 1,282	$ –347	$ 412

Table XXIII.—Business Statement of 10 Better-paying Farms of the Hinckley Area, Millard County, Utah, 1914, Showing Type of Farming

	No.	Value
Farm Capital		
Total acres in farm	163	$ 9,175
Milk cows	6	372
Other cattle	12	427
Horses and colts	6	632
Sheep	2	11
Hogs	3	112
Poultry	43	22
Machinery		660
Feed and supplies		268
Cash		149
Total Farm Capital		$11,828
Farm Receipts		
Crops		$ 5
Potatoes		63
Grain		531
Hay		2
Fruit and vegetables		1,019
Alfalfa seed		
Livestock		151
Dairy products		329
Cattle		88
Horses		3
Sheep and wool		154
Hogs		43
Poultry and eggs		273
Miscellaneous receipts		177
Increase in feed and supplies		
Total Farm Receipts		$ 2,838
Farm Expenses		
Hired labor		$ 157
Machinery repairs and depreciation		12
Building and fence repairs and depreciation		34
Feed		36
Horseshoeing and veterinary fees		2
Breeding fees and seeds		26
Threshing and twine (excludes toll)		32
Machine work hired		8
Taxes		64
Water tax		10
Miscellaneous expenses		25
Value of family labor		83
Total Farm Expenses		$ 489
Farm Income (receipts minus expenses)		$ 2,349
Interest on Total Farm Capital (at 8 per cent)		946
Labor Income		$ 1,403

Table XXIV.—Business Factors of Farms of Hinckley Area, Millard County, Utah, 1914, Showing Type of Farming

	Average of 10 bet-paying farms	Average of all 59 farms
Diversity of Farming		
Number of sources of income	6.3	5.2
Number of crops grown	4.3	4
Number sources income over 10 per cent gross receipts	3	3
Sources of income over 10 per cent gross receipts:		
Alfalfa seed	$ 1,019	$ 340
Hay	531	244
Cattle	329	186
Size of Farm Business		
Total farm capital	$11,828	$ 9,650
Total acres in farm	163	153
Crop acres	78	52
Acres alfalfa	56	35
Bushels alfalfa seed raised	138	49
Number of milk cows kept	6	5
Number of work horses	3.8	3.5
Productive animal units	18	13
Productivity of Crops		
Crop receipts per crop acre	$ 21	$ 13
Receipts from alfalfa seed per acre	44	36
Crop yields per acre:		
Potatoes	55 bu.	49 bu.
Spring wheat	10 bu.	6 bu.
Fall wheat	11 bu.	23 bu.
Oats	20 bu.	16 bu.
Rye	—	13 bu.
Alfalfa	2.2 tons	2.2 tons
Alfalfa chaff	0.7 tons	0.8 tons
Productivity of Livestock		
Net livestock receipts per $100 feed fed	$ 161	$ 130
Net livestock receipts per P. A. U.	43	40
Cattle receipts per head	28	26
Milk receipts per cow	17	24
Man Labor Efficiency		
Productive animal units per man	14	11
Crop acres per man	61	45
Horse Labor Efficiency		
Crop acres per work horse	20	15
Labor Income	$ 1,403	$ 323

Table XXV.—Business Statement of Farms of Hinckley Area, Millard County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 60 farms
Farm Capital			
Real estate	$ 7,550	$ 9,005	$ 7,262
Livestock	1,645	1,178	1,392
Machinery and tools	521	630	452
Feed and seeds	280	202	184
Cash	94	105	65
Total Farm Capital	$10,090	$11,120	$ 9,355
Farm Receipts			
Crops	$ 1,491	$ 279	$ 588
Livestock	713	205	458
Miscellaneous receipts	280	249	183
Increase in feed and seeds inventory	62	0	58
Total Farm Receipts	$ 2,546	$ 733	$ 1,287
Farm Expenses			
Current farm expenses	$ 451	$ 490	$ 357
Depreciation in mach., bldgs., fences	80	118	78
Decrease in inventory of feeds and seeds	0	9	0
Total Farm Expenses	$ 531	$ 617	$ 435
Farm income (receipts-expenses)	$ 2,015	$ 116	$ 852
Interest on Total Farm Capital (at 8 per cent)	807	890	748
Labor Income	$ 1,208	$ –774	$ 104

Table XXVI.—Business Factors of Farms of the Hinckley Area, Millard County, Utah, 1915, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 60 farms
Diversity of Farming			
Productive animal units per 100 acres crops	39	22	22
Size of Farm Business			
Total farm capital	$10,090	$11,120	$ 9,355
Working capital	2,540	2,115	2,092
Total acres in farm	114	209	155
Crop acrees	58	49	51
Productive animal units (P. A. U.)	23	11	16
Productivity of Crops			
Crop index (percentage)	109	88	100
Productivity of Livestock			
Net livestock receipts per $100 feed fed	$ 119	$ 48	$ 97
Net livestock receipts per P. A. U.	31	19	29
Feed fed per livestock unit	23	30	24
Man Labor Efficiency			
Productive animal units per man	18	7	12
Crop acres per man	45	33	40
Horse Labor Efficiency			
Crop acres per work horse	16	14	15
Labor Income	$ 1,208	$ −774	$ 104

Table XXVII.—Business Statement of Farms of Hinckley Area, Millard County, Utah, 1916, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 39 farms
Farm Capital			
Real estate			
Land	$ 5,033	$ 6,665	$ 5,171
Buildings	754	1,571	938
Livestock	1,491	1,023	1,246
Machinery	552	383	408
Feed and supplies	282	184	220
Total Farm Capital	$ 8,112	$ 9,826	$ 7,983
Farm Receipts			
Crops			
Potatoes	$ 17	$ —	$ 2
Grain	242	154	146
Hay	551	55	222
Sugar-beets	—	—	9
Other crops (alfalfa seed)	777	87	307
Livestock			
Dairy products	124	87	112
Poultry and egg sales	82	25	60
Cattle sales	223	101	167
Horse sales	32	29	59
Sheep sales	12	—	5
Swine sales	213	72	96
Other receipts	423	273	235
Increase in livestock inventory	156	—	22
Increase in machinery inventory	51	51	28
Increase in feed and supplies	168	22	112
Total Farm Receipts	$ 3,071	$ 956	$ 1,582
Farm Expenses			
Blacksmith and machine work	$ 115	$ 58	$ 67
Hired labor	72	63	58
Mach., bldg., and fence material	115	86	73
Feed and seeds	24	90	45
Fees, rents, and taxes	111	81	85
Other expenses	43	26	30
Livestock purchased	146	60	138
Decrease in livestock inventory	—	109	—
Decrease in land and buildings	15	24	16
Value of family labor	79	81	63
Total Farm Expenses	$ 720	$ 678	$ 575
Farm Income (receipts-expenses)	$ 2,351	$ 278	$ 1,007
Interest on Total Farm Capital (at 8 per cent)	649	786	639
Labor Income	$ 1,702	$ −508	$ 368

Table XXVIII.—Business Statement of Farms of Pleasant Grove Area, Utah County, Utah, 1916, Showing Type of Farming

	Average of 10 better-paying farms	Average of 10 least-profitable farms	Average of all 57 farms
Farm Capital			
Real estate			
Land	$ 8,060	$ 3,642	$ 5,019
Buildings	1,195	1,030	1,235
Livestock	1,526	536	892
Machinery	613	182	350
Feed and supplies	358	287	296
Total Farm Capital	$11,752	$ 5,677	$ 7,792
Farm Receipts			
Crops			
Potatoes	$ 365	$ 17	$ 133
Grain	237	91	141
Hay	51	—	41
Sugar-beets	352	96	298
Fruit	98	185	126
Other crops	25	11	18
Livestock			
Dairy products	361	6	170
Poultry and egg sales	75	20	57
Cattle sales	627	47	186
Horse sales	—	40	36
Sheep sales	1	1	3
Swine sales	330	31	82
Other receipts	244	71	178
Increase in livestock inventory	211	—	56
Increase in machinery inventory	28	50	24
Increase in feed and supplies	176	30	87
Increase in land and buildings	36	20	13
Total Farm Receipts	$ 3,217	$ 716	$ 1,649
Farm Expenses			
Blacksmith and machine work	$ 54	$ 34	$ 38
Hired labor	130	57	77
Mach., bldg., and fence material	125	84	87
Feed and seeds	141	27	58
Fees, rents, and taxes	154	111	128
Other expenses	31	66	28
Livestock purchased	422	20	111
Decrease in livestock inventory	—	23	—
Value of family labor	107	70	81
Total Farm Expenses	$ 1,164	$ 492	$ 608
Farm Income (Receipts-expenses)	$ 2,053	$ 224	$ 1,041
Interest on Total Farm Capital (at 8 per cent)	940	454	623
Labor Income	$ 1,113	$ −230	$ 418

Table XXIX.—Average farm prices in Utah, December 1, 1880-1918(1)

Product	Prices											
	1880-1889	1890-1899	1900-1909	1910	1911	1912	1913	1914	1915	1916	1917	1918(1)
Corn	$0.71	$0.58	$0.74	$0.84	$0.81	$0.75	$0.70	$0.75	$0.80	$1.15	$1.70	$1.81
Wheat	.75	.62	.75	.84	.70	.75	.73	.86	.86	1.52	1.78	1.88
Oats	.44	.38	.48	.48	.47	.49	.40	.43	.45	.61	.85	.97
Barley	.58	.50	.57	.60	.66	.59	.55	.50	.52	.76	1.20	1.40
Rye	.62	.52	.64	.68	.70	.68	.60	.60	.65	1.00	1.60	1.80
Potatoes	.45	.42	.50	.59	.85	.49	.58	.60	.63	1.30	.78	.97
Hay	7.00	5.72	7.44	9.00	9.00	8.00	9.10	7.70	8.00	15.00	15.00	17.10
Sugar-beets	....	....	....	....	4.81	4.97	—	4.79	4.91	5.73	7.04	10.00
Apples	....	....	....	....	1.10	.89	.96	.63	.95	1.60	.80	1.40
Peaches	....	....	....	....	1.83	1.06	1.15	.71	.95	1.25	1.30	1.40(2)
Pears	....	....	....	....	.88	1.10	1.30	1.00	1.35	....	1.20	1.60(3)

(1) U. S. D. A., Yearbook, 1917, Dec. 1, Farm Prices from 1880-1917.
Prices for 1918 were taken from U. S. D. A., Monthly Crop Report, Dec., 1918.
(2) Farm prices on Oct. 15, 1918.
(3) Farm prices on Nov. 15, 1918.

Table XXX.—Tenure and use of Farm Lands, 32 Farms, Hyde Park, Cache County, Utah, 1914, 1915, and 1916

Item	1914 Farms Reporting	1914 Total Acres	1915 Farms Reporting	1915 Total Acres	1916 Farms Reporting	1916 Total Acres
Farm Area	32	3,680.83	32	3,812.58	32	3,806.33
Owned by operator	32	2,940.83	32	3,066.08	32	2,984.33
Cash rented	11	546.00	9	351.50	11	498.00
Share rented	3	194.00	5	395.00	4	324.00
Crops	32	1,878.36	32	1,811.80	32	1,624.34
Pasture	28	1,305.00	30	1,262.03	....	Not given ....
Summer Fallow	8	415.17	7	547.00	....	Not given ....
Farmstead and waste	32	82.30	32	191.75	....	Not given ....
Dry-farm land	10	1,085.34	10	1,183.25	12	Not given
Winter wheat	10	500.00	10	536.50	12	574.50
Barley	10	170.17	7	99.75	5	28.75
Irrigated crop land	32	1,208.19	32	1,175.55	32	1,018.34
Alfalfa	30	428.96	27	395.33	30	438.50
Timothy and clover	10	76.00	13	129.83	6	48.00
Wild hay, etc.	7	131.00	5	122.00	10	85.00
Sugar-beets	29	307.83	29	293.25	29	293.50
Oats	22	113.25	24	94.75	20	71.83
Spring wheat	14	86.00	17	87.00	14	73.00
Alfalfa seed	1 (H-3)	12.00	1 (H-3)	15.00	....	....
Potatoes	27	42.45	19 (Blight)	25.50	13	8.51
Other crops	....	10.70	....	12.89	....	Not given ....

Table XXXI.—Tenure of Farms in Utah, by Counties, 1880[1]

Area	Number of Farms	Average Size (Acres)	Farms Owned	Farms Rented for	
				Cash	Share
The State	9,452	69	9,019	60	373
County					
Beaver	211	60	204	....	7
Boxelder	533	88	486	8	39
Cache	998	85	943	22	33
Davis	560	101	531	1	28
Emery	84	127	81	....	3
Iron	217	55	202	2	13
Juab	185	63	185	....	....
Kane	214	32	200	....	14
Millard	235	62	224	....	11
Morgan	182	61	174	....	8
Piute	134	118	130	....	4
Rich	153	135	147	1	5
Salt Lake	961	53	910	10	41
San Juan	31	43	31	....	....
Sanpete	1,015	49	999	5	11
Sevier	429	53	402	....	27
Summit	298	96	287	2	9
Tooele	304	75	275	1	28
Uinta	7	21	7	....	....
Utah	1,321	68	1,271	4	46
Wasatch	339	59	330	1	8
Washington	193	38	190	....	3
Weber	848	68	810	3	35

[1]1880 U. S. Census.

Table XXXII.—Tenure of Farms in Utah, by Counties, 1890(1)

Area	Number of Farms	Average Size	Cultivated by Owners	Cash Rent	Share Rent	Percentages		
						Owned	Cash Rent	Share Rent
The State	10,517	126	9,974	121	422	94.8	1.15	4.01
Counties								
Beaver	210	77	197	1	12	93.81	.48	5.71
Boxelder	478	900	463	4	11	96.86	.84	2.30
Cache	1,065	94	979	31	55	91.93	2.91	5.16
Davis	682	120	634	9	39	92.96	1.32	5.72
Emery	266	111	256	2	8	96.24	.75	3.01
Garfield	93	77	91	....	2	97.85	....	2.15
Grand	56	108	52	1	3	92.86	1.78	5.36
Iron	198	29	193	....	5	97.47	....	2.53
Juab	97	157	93	1	3	95.88	1.03	3.09
Kane	120	66	112	....	8	93.33	....	6.67
Millard	360	135	302	....	4	98.69	....	1.31
Morgan	238	85	211	....	27	88.66	....	11.34
Piute	143	126	137	....	6	95.80	....	4.20
Rich	193	491	188	2	3	97.41	1.04	1.55
Salt Lake	1,366	54	1,254	45	67	91.80	3.29	4.91
San Juan	38	108	38	....	....	100.00	....	....
Sanpete	1,191	80	1,163	4	24	97.65	.34	2.01
Sevier	312	88	297	....	15	95.19	....	4.81
Summit	362	97	345	2	15	95.31	.55	4.14
Tooele	301	137	281	5	15	93.36	1.66	4.98
Uinta	186	106	186	....	....	100.00	....	....
Utah	1,198	57	1,159	7	32	96.75	.58	2.76
Wasatch	289	68	277	....	16	95.85	....	4.15
Washington	187	26	181	....	6	96.79	....	3.21
Weber	942	63	885	7	50	93.95	.74	5.31

(1)1890 U. S. Census.

Table XXXIII.—Tenure of Farms in Utah by Counties, 1900(1)

Area	Number of Farms	Average Size	Cultivated by Owners	Part Owners	Owners and Tenants	Manager	Cash Tenant	Share Tenant
The State	19,387	212.4	15,177	2,051	135	311	506	1,207
Counties								
Beaver	301	97.1	216	16	....	....	2	22
Boxelder	1,017	561.1	813	115	6	21	15	47
Cache	1,795	176.4	1,446	236	6	16	15	76
Carbon	144	194.3	112	10	4	5	7	6
Davis	938	240.9	611	217	11	16	43	40
Emery	458	118.3	400	12	....	3	6	37
Garfield	237	121.5	228	3	2	....	....	4
Grand	121	129.6	100	5	....	5	2	9
Iron	235	100.3	197	2	6	13	2	15
Juab	356	222.8	249	62	3	3	4	35
Kane	213	112.4	188	17	....	4	....	4
Millard	676	159.8	575	52	5	7	10	27
Morgan	299	463.6	217	38	3	12	7	22
Piute	189	145.8	159	6	1	1	5	17
Rich	276	582.8	230	3	....	21	4	18
Salt Lake	2,208	125.0	1,561	250	17	41	152	187
San Juan	85	221.7	66	6	1	7	5	....
Sanpete	1,618	116.6	1,313	115	5	30	11	144
Sevier	946	79.5	810	64	5	17	8	42
Summit	608	476.4	526	19	....	19	12	32
Tooele	487	238.2	422	12	2	16	9	26
Uinta	559	608.8	466	29	12	7	4	41
Utah	2,760	81.1	2,041	416	30	22	56	195
Wasatch	492	190.0	386	50	....	4	7	45
Washington	477	45.9	355	99	5	4	2	12
Wayne	271	108.3	215	15	2	2	6	31
Weber	1,479	126.2	1,098	181	9	13	105	73

(1)1910 U. S. Census.

Table XXXIV.—Tenure of Farms in Utah, by Counties, by Percentages, 1900(1)

Area	Number of Farms	Average Size	Percentages					
			Cultivated by Owners	Part Owners	Owners and Tenants	Manager	Cash Tenant	Share Tenant
The State	19,387	212.4	78.3	10.6	0.7	1.6	2.6	6.2
Counties								
Beaver	301	97.1	86.7	5.3	....	....	0.7	7.3
Boxelder	1,017	561.1	79.9	11.3	0.6	2.1	1.5	4.6
Cache	1,795	176.4	80.6	13.2	0.3	0.9	0.8	4.2
Carbon	144	194.3	77.8	6.9	2.8	3.5	4.8	4.2
Davis	938	240.9	65.1	23.1	1.2	1.7	4.6	4.3
Emery	458	118.3	87.3	2.6	....	0.7	1.3	8.1
Garfield	237	121.5	96.2	1.3	0.8	....	....	1.7
Grand	121	129.6	82.7	4.1	....	4.1	1.7	2.4
Iron	235	100.3	83.8	0.9	2.6	5.5	0.8	6.4
Juab	356	222.8	70.0	17.4	0.9	0.8	1.1	9.8
Kane	213	112.4	88.2	8.0	....	1.9	....	1.9
Millard	676	159.8	85.1	7.7	0.7	1.0	1.5	4.0
Morgan	299	463.6	72.6	12.7	1.0	4.0	2.3	7.4
Piute	189	145.8	84.1	3.2	0.5	0.5	2.7	9.0
Rich	276	582.8	83.3	1.1	....	7.6	1.5	6.5
Salt Lake	2,208	125.0	70.7	11.3	0.8	1.8	6.9	8.5
San Juan	85	221.7	77.6	7.1	1.2	8.2	5.9	....
Sanpete	1,618	116.6	81.1	7.1	0.3	1.9	0.7	8.9
Sevier	946	79.5	85.6	6.8	0.5	1.8	0.9	4.4
Summit	608	476.4	86.5	3.1	....	3.1	2.0	5.3
Tooele	487	238.2	86.7	2.5	0.4	3.3	1.8	5.3
Uinta	559	608.8	83.4	5.2	2.1	1.3	0.7	7.3
Utah	2,760	81.1	73.9	15.1	1.1	0.8	2.0	7.1
Wasatch	492	190.0	78.5	10.2	....	0.8	1.4	9.1
Washington	477	45.9	74.4	20.8	1.1	0.8	0.4	2.5
Wayne	271	108.3	79.3	5.5	0.8	0.7	2.2	11.5
Weber	1,479	126.2	74.3	12.2	0.6	0.9	7.1	4.9

(1) 1910 U. S. Census.

Table XXXV.—Tenure of Farms in Utah by Counties, 1910(1)

Area	Number of Farms	Average Size	Cultivated by Owners	Total Tenants	Share Tenants	Share-Cash Tenants	Cash Tenants	Not Specified	Managers
State	21,676	156.7	19,762	1,720	837	97	490	296	194
Counties									
Beaver	319	144.2	285	32	28	....	3	1	2
Boxelder	1,527	244.7	1,382	125	67	3	35	20	20
Cache	1,907	154.3	1,756	139	59	11	35	34	12
Carbon	171	331.3	155	15	2	2	2	9	1
Davis	1,302	97.7	1,205	92	21	2	24	45	5
Emery	666	145.2	625	38	27	1	5	5	3
Garfield	409	146.6	353	56	13	2	6	35	....
Grand	172	361.0	156	5	1	....	3	1	11
Iron	373	236.0	333	37	21	....	1	15	3
Juab	507	214.1	495	9	5	1	....	3	3
Kane	166	149.2	164	2	1	....	....	1	....
Millard	736	226.4	670	51	31	4	11	5	15
Morgan	242	395.2	213	24	4	14	6	....	5
Piute	198	130.7	174	24	20	1	1	2	....
Rich	219	682.7	198	17	7	....	10	....	4
Salt Lake	2,180	77.6	1,876	277	130	6	119	22	27
San Juan	157	310.8	151	3	1	....	....	2	3
Sanpete	1,708	153.3	1,628	78	60	5	10	3	2
Sevier	1,059	115.6	987	67	37	3	14	13	5
Summit	447	584.0	407	26	9	....	13	4	14
Tooele	320	276.0	289	26	12	4	19	11	5
Uinta	675	121.6	601	72	38	2	13	19	2
Utah	2,873	81.7	2,641	205	118	18	45	24	27
Wasatch	964	159.8	890	72	35	11	15	11	2
Washington	598	84.1	583	14	5	....	3	6	1
Wayne	246	128.5	233	11	7	1	1	2	2
Weber	1,535	96.6	1,312	203	78	6	106	13	20

(1)1910 U. S. Census.

Table XXXVI.—Percentage of all Farms Operated by Owners, Utah, 1889 and 1909(1)

		1909	1889
	State	91.2	94.8
	County		
1.	Kane	98.8	93.33
2.	Juab	97.6	95.88
3.	Washington	97.5	96.79
4.	San Juan	96.2	100.00
5.	Sanpete	95.3	97.65
6.	Wayne	94.7	.....
7.	Emery	93.8	96.24
8.	Sevier	93.2	95.19
9.	Davis	92.5	92.96
10.	Wasatch	92.3	95.85
11.	Cache	92.1	91.93
12.	Utah	91.9	96.75
13.	Summit	91.1	95.31
14.	Millard	91.0	98.69
15.	Grand	90.7	92.86
16.	Carbon	90.6	.....
17.	Boxelder	90.5	96.86
18.	Rich	90.4	97.41
19.	Tooele	90.3	93.36
20.	Iron	89.3	97.47
21.	Beaver	89.3	93.81
22.	Uinta	89.0	100.00
23.	Morgan	88.0	88.66
24.	Piute	87.9	95.80
25.	Garfield	86.3	97.85
26.	Salt Lake	86.1	91.80
27.	Weber	85.5	93.95

(1) U. S. Census Reports.

Table XXXVII.—Dates of Farm Crop Operations in Eight Areas of Utah[1]

Operation	Cache	Salt Lake	Utah	Carbon	Emery	Millard	Sevier	Beaver
Winter wheat (seeding)	9/15[2]	9/15	9/15	9/15	9/20	9/15	9/20	9/1
Winter wheat, date when harvest begins	7/15	7/9	7/9	7/10	7/14	7/14	7/14	7/10
Winter wheat, harvest general	7/15	7/15	7/15	8/10	8/10	7/18	7/18	7/20
Spring wheat, seeding begins	4/2	4/2	4/2	4/1	4/1	4/1	4/1	4/1
Spring wheat, seeding general	4/28	4/20	4/20	4/14	4/14	4/10	4/10	4/9
Spring wheat, harvest begins	8/10	8/6	8/6	8/1	8/1	8/6	7/20	7/18
Spring wheat, harvest general	9/15	9/15	9/15	9/12	9/12	9/10	9/12	9/12
Winter oats, sowing begins	8/20	9/1	9/1	9/15	9/15	9/18	9/18	9/18
Winter oats, harvest begins	7/1	7/15	7/15	7/25	7/25	7/25	7/25	7/25
Spring oats, seeding begins	4/10	3/20	3/20	4/10	4/10	3/20	4/10	4/10
Spring oats, seeding general	4/20	4/15	4/25	4/15	4/15	4/25	4/15	4/15
Spring oats, harvest begins	8/10	8/1	8/1	8/4	8/1	7/25	8/1	8/1
Spring oats, harvest general	9/2	8/25	8/25	8/27	8/27	8/25	8/24	8/22
Corn, planting begins	4/25	5/5	5/5	5/7	5/7	5/15	5/12	5/12
Corn, cutting silage begins	8/28	9/1	9/1	9/1	9/1	9/1	9/1	9/1
Corn, cutting and shocking begins	9/5	9/15	9/15	9/1	9/1	9/1	9/1	9/1
Corn, husking and jerking begins	10/1	10/10	10/10	9/10	9/10	9/20	9/5	9/5
Kafir, harvest begins	8/1	8/10	8/10	8/20	9/1	9/1	9/15	9/15
Timothy and Clover, first cutting begins	7/1	7/5	7/5	7/5	7/5	7/5	7/10	7/10
Alfalfa, first cutting	6/20	6/5	6/5	6/20	6/20	6/20	6/20	6/20
Alfalfa, second cutting	8/10	8/1	8/1	8/5	8/5	8/5	8/1	8/1
Early potatoes, planting begins	4/11	4/10	4/10	4/25	4/25	4/25	4/15	4/15
Early potatoes, digging begins	7/6	6/5	6/5	7/4	7/4	7/4	7/10	7/10
Northern Commercial, planting begins	5/20	5/20	5/20	5/11	5/11	5/11	4/25	4/25
Northern Commercial, digging begins	10/6	10/6	10/6	10/20	10/20	10/20	10/20	10/20
Sugar-beets, planting begins	4/1-10	4/1-10	4/1-10	.....	.....	4/1-15	4/1-10	.....
Sugar-beets, thinning begins	5/20	5/15	5/15	5/1	5/1	5/1	5/20	5/20
Sugar-beets, pulling begins	9/25	10/1	10/1	10/5	10/5	10/5	9/25	9/25
Field beans, planting begins	5/10	5/10	5/10	4/15	4/15	4/15	5/10	5/10
Field beans, harvest begins	9/10	8/10	8/10	9/10	9/10	9/10	9/20	9/20
Elberta peach picking begins	9/5	9/1	9/1	9/10	9/10	9/10	9/10	9/10
Ben Davis apples	10/10	10/15	10/15	.....	.....	.....	.....	.....
Tomatoes	8/25	8/25	8/25	.....	.....	.....	.....	.....

(1) Baker, O. E., and others, U. S. D. A., Yearbook, 1917, pp. 537-591, or Yearbook separate, No. 758.
(2) First figure represents the number of the month; the second figure the date of month.

Comparison of the average crop yields in Utah with the average yields of Iowa and the United States. Yields used are for the ten years 1905-14 as given in the 1914 yearbook of the United States Department of Agriculture.

Table XXXVIII.—Average Yields of Seven Important Utah Crops

Crop	Ten-year Average Acre-yields			Percentage of average U. S. yields	Percentage of average Iowa yields
	Utah	United States	Iowa		
Hay	2.81 tons	1.40 tons	1.39 tons	201	202
Potatoes	152 bu.	96.5 bu.	82 bu.	158	185
Corn	31.9 bu.	26.6 bu.	34.9 bu.	120	91
Winter wheat	22.8 bu.	15.7 bu.	21.2 bu.	145	108
Spring wheat	27.3 bu.	13.3 bu.	15.4 bu.	210	177
Oats	45.4 bu.	29.6 bu.	31.9 bu.	153	142
Barley	41.2 bu.	25.1 bu.	26.2 bu.	164	157
Total				1,151	1,062
Average				164	152
Percentage better yield				64	52

Table XXXIX.—Percentage Yield, or Crop Index, Based on Average U. S. Yields

Crop	Acres Grown in Utah, 1909	Comparative Yield Per Acre	Acres Multiplied by the Percentage Yield
Hay	405,394	201	81,484,194
Potatoes	14,210	158	2,245,180
Corn	7,267	120	872,040
Winter wheat	119,948	145	17,392,460
Spring wheat	58,442	210	12,272,820
Oats	80,816	153	12,364,848
Barley	26,752	164	4,389,328
Total	712,829		131,020,870

Percentage yield, or crop index $= \frac{131,020,870}{712,829} = 184$

Table XL.—Percentage Yield, or Crop Index, Based on Average Iowa Yields

Crop	Acres Grown in Utah, 1909	Comparative Yield Per Acre	Acres Multiplied by the Percentage Yield
Hay	405,394	202	81,889,588
Potatoes	14,210	185	2,628,850
Corn	7,267	91	661,297
Winter wheat	119,948	108	12,954,384
Spring wheat	58,442	177	10,344,234
Oats	80,816	142	11,475,872
Barley	26,752	157	4,200,064
Total	712,829		124,154,289

Percentage yield, or crop index $= \frac{124,154,289}{712,829} = 174$

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BIOGRAPHICAL

Birth and Marriage.—Edgar Bernard Brossard was born on the Brossard Stock Ranch, Oxford, Bannock County, Idaho, April 1, 1889. Son of Alphonse Aimable and Mary Catherine (Hobson) Brossard.

Married Laura Parkinson Cowley, daughter of Mathias Foss and Luella Smart (Parkinson) Cowley, August 25, 1915.

School and Collegiate Record.—Attended the grade schools at Oxford, Idaho; and Ogden and Logan, Utah; and did high school and college work at the Utah Agricultural College, 1904-5 and 1906-1911 inclusive, where he was granted the Batchelor of Science degree in General Science with a major in Economics, June, 1911.

September 1916 to June 1917 he was a graduate student in Agricultural Economics and Farm Management at the University of Minnesota, where he was granted the Master of Science degree in June 1917. September 1917 to June 1918 he did graduate work in Agricultural Economics and Farm Management at Cornell University. From June 1918 to September 1919 he was again registered in the Graduate School of the University of Minnesota, from which school he was granted the degree of Doctor of Philosophy (Ph.D.) June 1920, with a major in Agricultural Economics and a minor in Farm Management.

Teaching Experience.—He was instructor in mathematics at the Utah Agricultural College, 1909-1910. He was State Farm Management Demonstrator for Utah for two years and three months, September 1, 1914 to August 31, 1916, and again from June 1, 1917 to August 31, 1917. At the University of Minnesota, 1916-17 he was assistant Farm Management Demonstrator and in 1918-19 he was instructor in Farm Management. From September 1, 1919 to date he has been Professor of Farm Management at the Utah Agricultural College and in charge of Farm Management Investigations at the Utah Agricultural Experiment Station.

Organizations and Fraternities.—He is a member of the American Farm Economic Association, The National Irrigation and Drainage Congress, The Utah Educational Association, Pi Zeta Pi (a social fraternity), Alpha Zeta, (a professional agricultural fraternity), Gamma Sigma Delta (an honorary agricultural fraternity) and Phi Kappa Phi (an honorary scholastic fraternity).

Other Activities.—In undergraduate years he took part in college activities. He was the first "Four-letter" athlete of the Utah Agricultural College, having won four official sweaters in one year, one each for football, basketball, baseball, and track, and one year was captain of the football team, and another year manager of basketball. He took part in college dramatics and was on the editorial staff of the college paper as well as class president of the graduating class 1911.

His work and studies while not in college, have permitted him to travel and become somewhat familiar with the States of the United States lying West of the Mississippi River and Minnesota, Illinois and New York. He studied thirty-two months in Europe, October 1911 to May 1914, and while there visited the large cities and some of the most interesting parts of England, France, Germany, Switzerland, Holland, and Belgium. Headquarters while in Europe were at Paris, France, where he learned to read, write, and speak the French language.

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